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C. T. HUTCHINSON, Acting Editor

NORMAN S. GALLISON, GEORGE C. TENNEY, Associate Editors

ROBERT SIBLEY, Consulting Editor
CLOTILDE GRUNSKY, Contributing Editor

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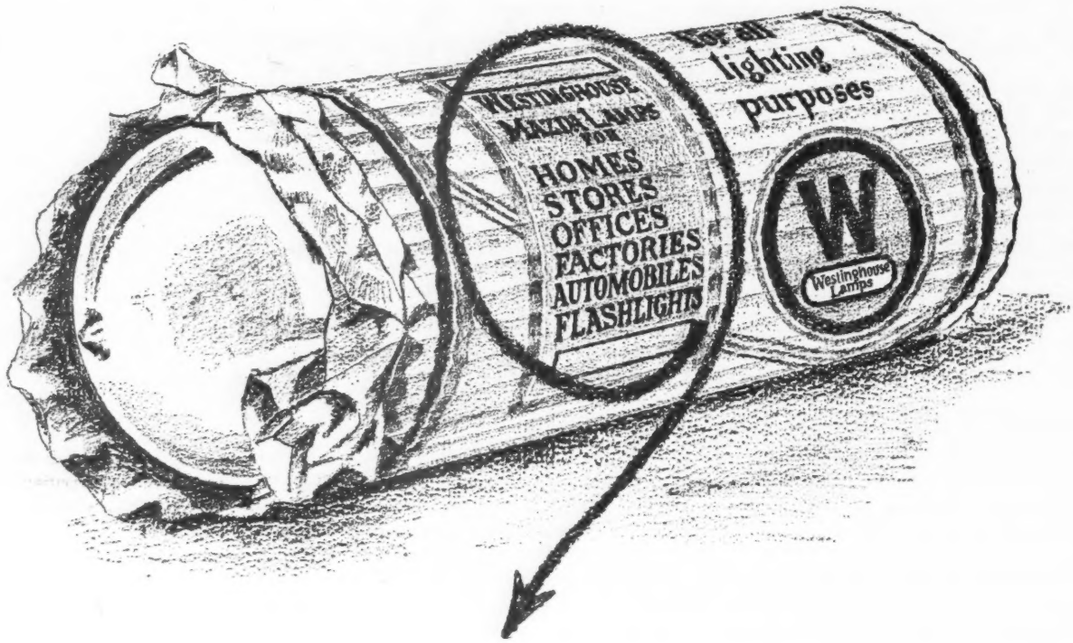
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For Sale—A Service

THE success or failure of the various electrical cooperative movements of the West depends primarily upon adequate financing. In order to carry on their activities these organizations must be provided with funds by the electrical industry in the states where they operate and by the national electrical manufacturers whose products are most benefited by the story which the organizations tell to the public. The question has been raised as to why the cooperative campaigns or leagues should be financed at all. The answer is simple: Because they render a service to the electrical industry as its educational institution that the industry or any one of its constituent branches cannot render to itself.

A FINANCIAL contribution to one of these organizations by either a company or an individual is directly chargeable to one of two accounts,—new business or advertising. Consider for a moment the amount of advertising which could be purchased for the sum which the companies as individuals have been asked to contribute. It might buy a hundred column inches in a local newspaper to be used in a week and forgotten by the public in less time than that. Charged to new business, it might pay the expenses of one salesman on a "trip" from San Francisco to Los Angeles on the trail of a "hot" prospect.

FOR purposes of comparison, review a few of the activities of the California Electrical Cooperative Campaign and then determine whether that same service could have been purchased by individual company effort at the same price which the Campaign is asking in the form of individual contributions. In the State of California there is no electrical company with its commercial aspect, that could be given entrée into the schools of any one locality. The California Electrical Cooperative Campaign, being an educational institution only, with no commercial aspects, has recently exhibited electrical production and utilization films to 21,997 pupils with their teachers in the public schools of one of California's leading cities.

LAST year the Campaign told the electrical story by means of motion pictures and projected slides in the theaters of California to 561,000 people at a total cost to the entire electrical industry of $109, or less than 18 cents per thousand. Is there any scheme of advertising that has ever been evolved by any one contributing company that has given such an advertising value at so low a rate? Year before last the Campaign gave the industry $30,000 of newspaper space in the form of publicity at a cost to the industry of less than $3,400, a record which no individual company can approach.

THIS year, in the exhibition of ten electrical homes, the story of utilization of current consuming devices will be told by the personal contact method to 250,000 people in California. What would an individual company pay if it could, by word of mouth, tell its story to 250,000 interested and attentive people?

THESE are but a few of the past achievements and future plans of one of the western cooperative organizations. Service of this character is being rendered in other sections of the West by the Electric Service League of British Columbia, the Denver Electrical Cooperative League, the Electric Club of Seattle, and the Rocky Mountain Electrical Cooperative League. As necessary and valuable educational institutions, they deserve the confidence and the moral and financial support of the entire electrical industry. Each has a service to sell with no self-evident securities but with definite assurances. What is this service worth to you?

Destructive Competition vs. Sound Regulation

PRESENT-DAY enlightenment has shown that many of our time-honored business axioms should be taken with a grain of salt. Among them may be mentioned the mossgrown saying that "Competition is the life of trade."

The truth, or untruth, of this saying depends entirely upon the kind of competition. Fundamentally, there are but two kinds of competition, price and service; this may be expressed even more clearly as destructive and constructive.

At intervals, politicians, office seekers and self-styled economists mount blithely upon their soap boxes and shed bitter tears in lament for the passing of the "good" old times of free-for-all price competition that left a trail marked by the wrecks of many worthy enterprises.

The evolution of the public utility is a striking example of the progress of human intelligence. So short a time as twenty years ago we had with us the political boss with the itching palm, price wars between rival groups with the costly and useless duplication of service, the frantic rush for franchises, the graft of the walking delegate, and all the other evils that dissipated capital and made a joke of the word, "service."

Now, under the guise of "home rule," so-called, an attempt is being made to destroy the fine accomplishments of private ownership under commission regulation. The professional politician would place within counties, even municipalities, the power to regulate the conduct of all public utilities. Thus, instead of a state commission, there would be as many commissions as counties, a plan so absurd, when the nature of the service rendered is considered, as to make it difficult to understand how it could possibly receive serious consideration by intelligent people. Nevertheless, such a plan has been proposed and voted down in Oregon, is now being agitated in Colorado, and may even become a live issue in the next California elections.

A Wise Dealer Recognizes the Value of the Installment Plan

SUNDRY and various learned economists and other gentry given to horn-rimmed spectacles and profound theories have decried bitterly what is known as the "installment plan" of purchasing whatever one wants. It has been claimed that the installment idea makes it entirely too easy to buy, that it promotes ill-advised purchases beyond the means of the buyer, that it encourages the purchase of luxuries and that it works against that type of thrift of which a savings bank account is the exemplar.

Nevertheless, the dollar-down and a dollar-a-month idea has grown and grown so that the economic soundness of the principle is no longer open to question. Nowadays practically every human need with the single exception of food can be satisfied with payments in small installments and at regular intervals by individuals who have steady jobs and bear good repute in the community.

The homeopathic installment is a pill much easier to take than the bitter allopathic dose of a sizable sum in one lump for the more expensive electrical appliances such as the washing machine or the range. The dealer who is shrewd enough to finance the large floating capital investment required by the installment plan of sales, and who is gifted with a discerning credit sense, or who, failing in these qualities himself, is clever enough to attach himself to a financial organization that can supply these deficiencies, is on the high road to success, while his happy customers will experience a degree of domestic freedom and home comfort impossible of achievement by other means.

Consumer-Ownership, Private Initiative and Public Regulation Spell Service

ONE of the most significant high lights in the report of the Pacific Gas & Electric Company for the first two months of 1923 lies in the following statement by A. F. Hockenbeamer, vice-president:

"Lower electric rate schedules were put into effect Feb. 20, 1923. These rates, in contradistinction to practically all other commodities and services, are substantially below pre-war levels and are probably the lowest in the country, considering the extent of the territory and the widespread distribution effected through a network of more than 11,000 miles of transmission and distribution lines, reaching into hundreds of cities, towns and hamlets, and serving thousands of customers in purely farming sections."

Obviously, as Mr. Hockenbeamer points out, "Such low rates have only been made possible through the enterprise of the company in developing new sources of hydroelectric energy and in building up an enlarged volume of business through intelligent and energetic sales efforts."

Thus, the consumer-ownership idea, in combination with the initiative of private ownership under close public regulation already has accomplished the utmost that the most frenzied advocates of public ownership promised so freely before the California elections last fall. What kind of bait will the public-ownership advocates use next?

Electrified Apartments Growing in Popularity on Pacific Coast

THE completely electrified home has been the subject of discussion in electrical circles for several years. The electrification of the apartment house has not received as much attention, yet builders of apartment houses have shown a tendency to adopt the latest electrical ideas. In several western cities by far the majority of new apartments being erected embody at least one, and in some cases all, of the latest electrical improvements.

Mr. Doerr's article in this issue will prove interesting reading, both to the electrical man and to the consumer contemplating electrifying his home. The cost data are especially illuminating. The figures quoted for typical apartment houses indicate that the cost of operating range and water heater, electric air heaters, and lights is economical, averaging less than twelve dollars per month in one instance noted for a four-room apartment, during the six winter months.

The convenience of the electric range makes a special appeal to the apartment house dweller. In fact, the apartment house has done much to popularize electric cookery, since it is quite often the first establishment of the newly-married, thus paving the way for a complete electrical installation when the new home is built. Several cases are also of record where people once skeptical of the efficiency of electrical ranges, became converted upon occupying an apartment where no other method of cooking was available. The electrical apartment has proved itself a valuable educator.

An interesting fact, not noted in the article by Mr. Doerr, is that twenty-three of the twenty-eight apartment houses listed have electric air heating in some form. Electric house heating has been condemned and derided as being impractical, wasteful and unsatisfactory—principally by people who have never used it. The editors of the Journal of Electricity and Western Industry have been criticized in the past for intimating that electric air heating was practical. This may be excusable because they enjoy it in their own homes.

In certain parts of the West where winter temperatures are not excessive, and where some heat is needed every month in the year, electric air heating is growing in popularity. The skeptic may say that it can't be done, but the manufacturers of electric air heaters are enjoying good business.

Industrial Necessity Makes Re-routing of Human Effort Necessary

THAT the present condition of high wages and a shortage of skilled men in many industries, particularly building, will cause a re-routing of human effort, is not unlikely. "Social standing" and "respectability," the fetishes which have made indifferent counter-jumpers out of potential good mechanics, do not appear as formidable as in the past. In those industries where opportunities have been opened to the embryo mechanic in the form of apprentice schools, there has been no dearth of applicants, principally of good types.

An eastern railroad house-organ, in commenting on the foolishness of calling one job "respectable," in comparison with another, has the following to say on this subject:

"From blue flannel collar to white collar has been the traditional general conception of advancement in the world of work. But a shortage of skilled hands to do necessary tasks has caused a New York institution to search out white collar men there and set them to learning various manual trades. Thus comes a re-routing of human endeavor, a departure from an accepted program. If this shift in transplanting men goes far enough, it will inevitably result in fresh emphasis being placed on the dignity of those who toil with their hands.

"Failure to learn real values in life can cost a young man his chance for success. On the false notion that greater 'respectability' would meritedly be attained by his taking a white collar 'position' for which he is unfitted, he may arbitrarily pass up opportunity to go with the flannel shirt gang where his aptitude could win for him wealth and justified pride in achievement.

"A great many harmful generalizations have been accepted by the public without question. One of them grew out of the fact that certain people who thought well of themselves put the stamp of their disapproval on people engaged in manual tasks. Others who had no business letting such an idea become popular have brainlessly permitted this stereotyped picture to persist unchallenged. But it is being challenged by cold necessity today.

"America has hard, sweaty, grimy work which must be done. The financial reward is attractive. Adaptability granted, the proposition of changing from the white collar into the laborer's flannel one is basically sound. On the ground floor, in the dirt and smoke, is the best place in the world to gain a working knowledge of men and material operations."

Possibly the next few years will produce many men who can describe their successful career thus: "From white collar to flannel collar to fur collar."

Prizes Offered for the Best Paper on Customer-Ownership of Securities

MANAGERS of public utility companies throughout Colorado, New Mexico and Wyoming, together with the Rocky Mountain Committee on Public Utility Information, have agreed to assist those within their territory who wish to participate in a national essay contest on the benefits of customer-ownership. This contest which is being conducted by Forbes Magazine, a New York financial and business publication, is open to everyone. Neither the utilities nor the Committee are in any manner connected with the contest but have offered to assist in making it a success by providing some of the data to all who wish to prepare papers.

It is to the material interest of public utilities that there be a wide and sympathetic understanding of utility problems on the part of the public. All western utilities have an excellent opportunity to capitalize on the nation-wide interest which is being aroused by this contest. We commend it to the attention of those officials in the various electrical utilities whose duty it is to foster the public's goodwill. The stimulation of local interest will have a favorable reaction.

CURRENT COMMENT

1922 Set New Records for Building Activity

The year 1922 was a record one from the standpoint of construction activity. This fact is borne out in a report prepared by Secretary of Commerce Hoover for President Harding in reply to a query as to the advisability of undertaking an extensive government construction program. The present administration has the direction of Congress to carry on a very considerable volume of construction work in all parts of the country. The President's query was prompted by the desire to be thoroughly acquainted with economic conditions in the building industry before determining to speed up the construction program to which the administration is committed.

A survey of the situation in the building trades brought out the following conclusions:

1. The year 1922 was a year of very large employment and activity in the construction trades and at the end of the year stocks of construction materials were greatly reduced. Since the beginning of the present year there has been even more activity than in the same period last year and the contracts let in the past few months are of larger volume than any hitherto entered into in a similar period. Advance orders for construction materials are upon a very large scale.

2. Labor in the construction trades and in the manufacture of materials is not only at full employment but there is actually a shortage in many directions.

3. Transportation facilities available for the building materials are fully loaded and almost constant car shortages are complained of with consequent interruption in production.

Secretary Hoover's reactions to the results brought out by the survey are contained in his reply to the President, in which he says:

"For the government to enter into competition at the present moment will give no additional employment to labor and no additional production of materials but must in the broad sense in the end displace that much private construction. The governments, nationally and locally, are in a much better position to hold construction work in abeyance than are private concerns, and are in better position to speed up in times of less demand as we did in the last depression as the result of the Unemployment Conference. We can, by this means, contribute something to a more even flow of employment, not only directly in construction work but in the material trades.

"I would recommend, therefore, that you direct the different divisions of the government to initiate no new work that is not eminently necessary to carry on the immediate functions of the government and that there should be a slowing down of work in progress so much as comports with real economy in construction, until after there is a relaxation in private demands."

Survey Shows Power Resources of Snake River

In the preparation of a plan for meeting the power demands of the future, a comprehensive knowledge of the water power resources of the nation is highly essential. Such knowledge is of particular importance to the West because it is estimated that fully 75 per cent of the potential water power of the United States is located west of the Rocky Mountains. The announcement of the U. S. Geological Survey that it will shortly publish a report on the water power resources of the Snake River will consequently be of considerable interest to central stations and engineers. The report will contain the results of an examination of the river between Huntington, Ore., and Milner, Idaho.

In its western course across southern Idaho, the Snake River has a total fall of approximately 2,000 ft. between Milner and Weiser. Of this drop, 340 ft. is concentrated at two points—at Twin Falls, where the fall is 140 ft., and at Shoshone Falls, where it is 200 ft. Shoshone Falls is now used for the development of power, but Twin Falls and many other places, fully described in the report, are valuable potential power sites not yet developed.

Prior to 1884, when the main line of the Oregon Short Line Railroad was completed across southern Idaho, the Snake River plain from Pocatello westward was a sagebrush desert. Boise had a population of about 50, and other points at which there are now large villages or cities were little more than stage stations. By 1890 the total population of the plain was perhaps 15,000, and a small amount of land was being irrigated. About 1900 the country began to realize that desert lands could be reclaimed by irrigation, and between 1900 and 1910 many extensive government and private irrigation systems were put into operation in southern Idaho and in other western states. Tracts in southern Idaho amounting to more than 1,200,000 acres are now being irrigated. With the growth of population that followed the opening of these vast tracts there came naturally

a demand for power. The Geological Survey's report gives a history of the development of power in this region. The first developments were small and were under local control, but as the field of operations widened interference between companies led to intense rivalry and to over-development, which was followed by depression and reorganization, resulting finally in the formation of the Idaho Power Company, which now owns and operates practically all the hydroelectric developments in southern Idaho along the Snake River. The report gives the history of each project in detail and describes the project works, at which over 70,000 hp. is now being made available for use.

The report will contain maps and descriptions of 19 sites at which 250,000 hp. could probably be developed, even during times of low water. It sets forth the amount of water available for power development and the scheme by which the fullest use may be made of the water.

Steam Plant Equipment For Japan

Steam power plant equipment will find a ready market in Japan since hydroelectric companies have awakened to the fact that their present systems are inadequate to care for the demand without the addition of auxiliary steam power stations. The Industrial Machinery division of the Department of Commerce reports that conditions in the island empire are such that power companies are realizing the absolute necessity of providing for standby service of some character.

The past winter has been an exceptionally dry one, with much less rain in the autumn than usual. As a consequence the streams and lakes upon which the various hydroelectric companies depend for power are very low, especially in eastern Japan. The Katsuragawa and the Kinugawa electric power companies, which supply the greater part of Tokyo with current, have been unable to meet the demands and as a consequence the Tokyo Electric Light Company has had to fall back on power from the steam plants in Asakusa which have been operating at full capacity.

Australia Offers Market for Electrical Goods

Opportunities for trade in Australia in electrical and allied lines are better today than they have been for the past decade, according to W. G. Watson, managing director of W. G. Watson & Company, Ltd., electrical engineers and merchants of Sydney, who is in this country on a business trip. Increases in plant capacity, delayed for several years owing to inability to get equipment during the war, are rapidly nearing completion. As this additional power is made available, the field for electrical appliances may be expected to become more active.

While considerable interest has been shown in hydroelectric projects, attention at the present time is directed toward the development of the enormous low grade brown coal deposits, where fuel can be delivered at the plant as low as 54 cents a ton. The new Morwell plant in Victoria is located on the edge of the coal deposits and is rapidly nearing completion. Power from this plant will be delivered to Melbourne and other large cities over several hundred miles of 150,000-volt transmission lines.

Mr. Watson's reflections regarding the American manufacturer and the Australian market are interesting. "Reduce your prices and you can sell the goods" is his counsel to those manufacturers who would develop an Australian market. He also suggests that a careful study of existing conditions and requirements be made before entering the market. Excessive transportation costs coupled with high prices prohibit the universal use of American made electric ranges.

Future of Radio Broadcasting is Now Assured

Radio broadcasting is on the eve of a new era of development. After an investigation which has lasted almost a year, the National Radio Conference has promulgated a set of regulations which have been accepted without limitations by the Department of Commerce. To use the words of Secretary Hoover, "the recommendations represent a step in ideal development of measures for the prevention of interference in public broadcasting."

The report recommends making available all wave lengths from 222 to 545 meters for public broadcasting, the various possible bands to be assigned to different stations so as not only to reduce interference, but also to build up zonal regions of distribution. The stations are divided into classes according to their power rating, and wave lengths assigned accordingly. Amateurs are given an entire area which will limit the possibility of interference with public broadcasting stations.

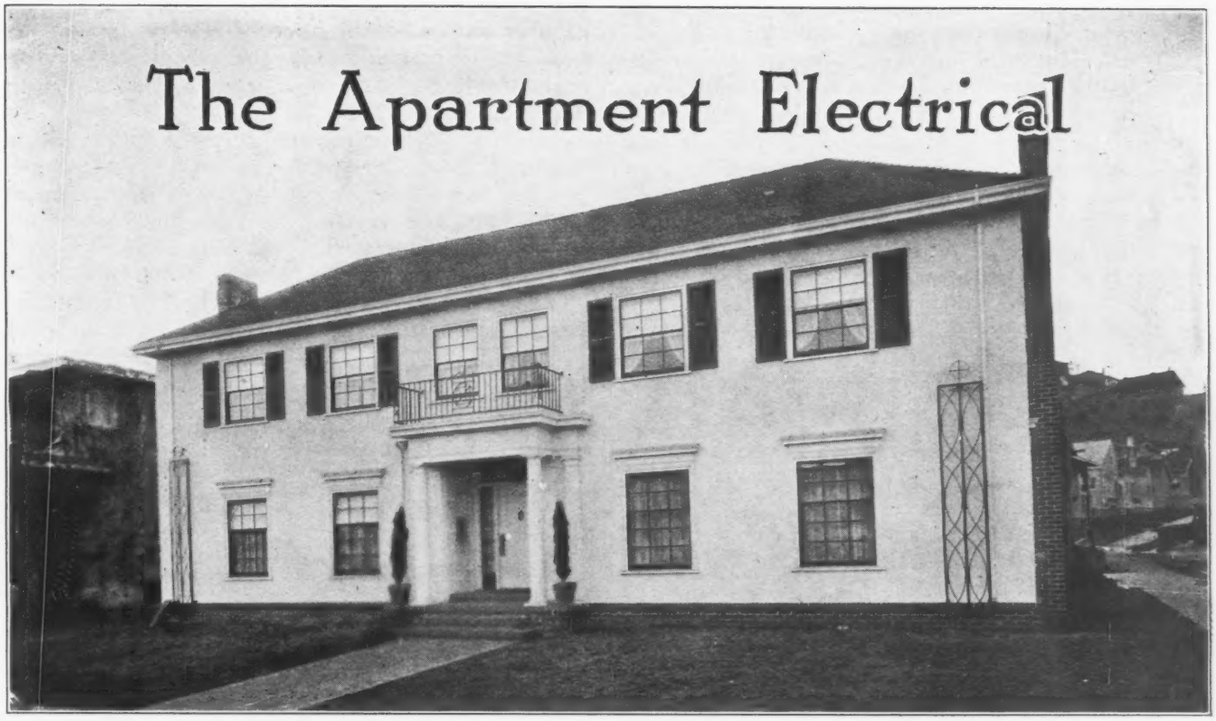
One of the important recommendations of the conference relates to the consolidation of broadcasting interests in each locality. In view of the limited facilities available and the uneconomic and tentative basis of present-day broadcasting, the conference has suggested that those desiring the establishment or maintenance of stations consolidate. It is felt that by such a plan the public will be benefited and broadcasting handled in an economic and permanent fashion.

The department fully accepts the recommendations of the conference, but recognizes a number of difficulties in placing the plan abruptly into action: First, the hardship that it may cause to various stations to move arbitrarily to new wave lengths; second, the difficulties introduced by the ship to shore communications which are now working to some extent on 300 meters and also on 450 meters.

It is to be hoped that the necessary legislative measures to carry out the recommendations of the conference will be passed immediately. At the same time steps must be taken to provide for the increased radio personnel needed by the Bureaus of Navigation and Standards of the Department of Commerce, for the enforcement of the regulations.

THE Midway plant of the San Joaquin Light & Power Corporation located at Buttonwillow, near the Elk Hills oil fields, uses natural gas for fuel. The capacity of the plant, which consists of two units, is 25,000 kva. The first unit was erected in 1921 and the second in 1922 and the construction is so arranged that additional units may be added.

The Apartment Electrical



By O. R. Doerr

Great Western Power Company, Oakland, Calif.

EXPERIENCE with thirty-seven apartment houses in Oakland, Calif., which are either wholly or partially electrified, has proven that intensive development of this field is highly desirable for the central station, manufacturer, jobber, dealer and contractor.

TO ATTEMPT to analyze the reasons for the growing popularity of the modern apartment would involve a discussion of the fundamental changes in the mode of living of the American people during the past decade. An increasing metropolitan population, the servant problem, the desire on the part of the housewife for more conveniences, comforts and fewer responsibilities, and the shortage and high cost of building homes have been some of the controlling factors in the gradual increase in the number of apartments in the larger cities. In making the apartment a more desirable dwelling place, the builder has incorporated new ideas for increasing the comfort and domestic felicity of his tenants as fast as they have been called to his attention. In the development of the apartment it is only natural that the attention of the builder would sooner or later turn to electricity and to the multiplicity of time and labor saving devices that have been developed for its utilization. From the standpoint of the central station, the manufacturer and the dealer, this interest which is being displayed by the apartment builder is of decided importance, for to them it means increased sales and revenue.

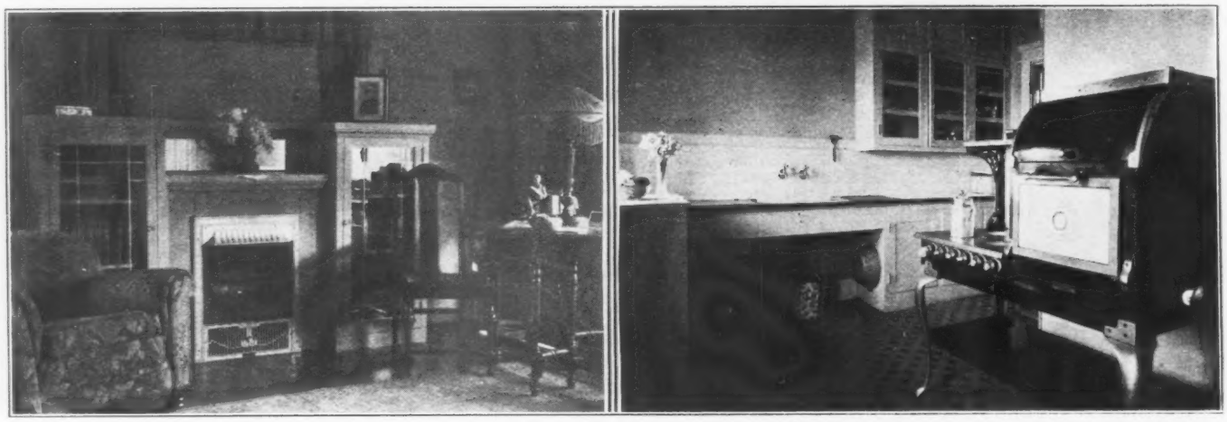
From a study of the application of electricity to apartment houses—and by that is meant not only lighting, but cooking, water heating and in some localities, air heating—it would appear that apartments offer most favorable opportunities for development. In Seattle, Portland, Boise, Butte, Denver, Salt Lake City, Los Angeles, Oakland and San Francisco there is an increasing tendency on the part of the central stations to recognize the great service that can be rendered to the public and the large increase in revenue possible in developing this service. Attractive rates have been put into effect, servicing facilities provided, and sales effort expended to increase the use of electricity in apartment houses. The result has been a ready response on the part of the builder with an increasing number of apartment houses equipped with electric ranges, electric water and air heaters.

It is true, of course, that this attitude, as is the case with all things new and untried, was not formulated in a month or a year. The pioneering activities had much resistance to overcome and the results were watched with a skepticism comparable to that attending the adoption of electricity for lighting. Many took the stand, "Be not the first by whom the new is tried." Yet the fact remains that those builders who were the first to make complete electrical installations in their buildings are continuing the practice in the construction of subsequent buildings.

Owing to the comparative novelty of completely electrifying apartments, a discussion of the results obtainable over a long period of years is impossible. However, there are installations in Oakland, Calif., which have been in operation a sufficient time to

conclusively prove that service of this type is exceedingly desirable from every standpoint.

Electric cookery has been, to a greater or less extent, before the public eye for some time. Coincident with the wider utilization of the electric range came its application to the apartment house. In fact, apartment houses have done much to spread the idea. There were installed in the Como Apartments in Oakland, early in 1916, thirty-seven of the early type electric ranges, all of which are in operation at the present time after more than seven years of almost continuous service. In this connection it is interesting to note that the builder of this apartment house has since adopted a policy of completely electrifying most of the buildings which he has since constructed.



On the left is the electric fireplace in one of the modern apartments, while on the right is an electric range which has been in operation seven years without interruption.

Ranges Only Installed

Figures on the consumption of electrical energy in this apartment house over a period of twelve months show the average consumption per range per month to be 79.9 kw-hr., ranging between a maximum of 145 kw-hr. and a minimum of 60 kw-hr. Each range has a capacity of 7 kw. or a total for the entire house of 259 kw., served by a 50-kw. transformer. The average monthly bill per consumer for this service is $3.18. An idea of the month to month fluctuation in the consumption can be gained from the following figures which show the amount of energy consumed by a typical range over a period of twelve months:

Jan.	110 kw-hr.
Feb.	95 "
March	82 "
April	79 "
May	66 "
June	71 "
July	82 "
Aug.	104 "
Sept.	124 "
Oct.	79 "
Nov.	99 "
Dec.	85 "
Total	1,076 kw-hr.

In the case of the above apartment house, the range and lighting service are metered separately.

A typical example of an apartment house where a cooking and lighting rate is in effect is the Reynard Apartments, of eight apartments of two and three rooms each, with a 7-kw. range in each apartment. Figures on the consumption of energy, in this case over a period of nine months, show the average monthly bill for each consumer is $5.32 with the individual bills ranging from $4.54 to $6.30 per month. The average consumption per apartment per month is 134 kw-hr. while the maximum consumption for any apartment during one month was 263 kw-hr. The total revenue from this apartment house for the nine-month period was $250.55 and the average monthly revenue per kilowatt of load was $0.76.

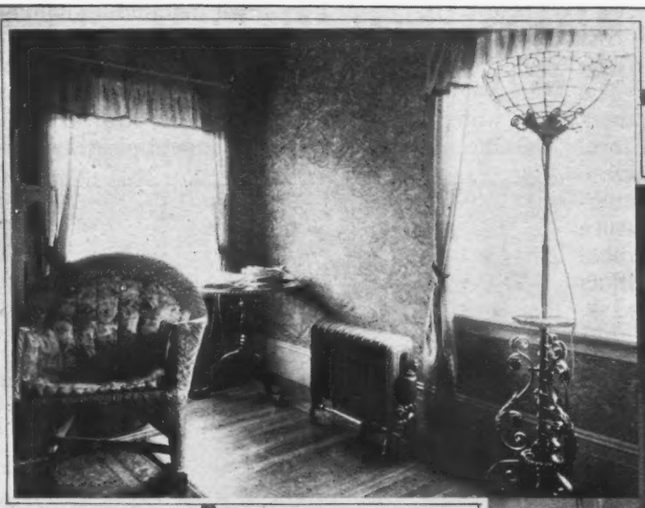
Electric air heating and electric water heating are the last of the major electric services applicable to home use which have been applied to the apartment. Owing to the remarkable results obtained, this type of service is rapidly growing in favor both with the builders and with the tenants.

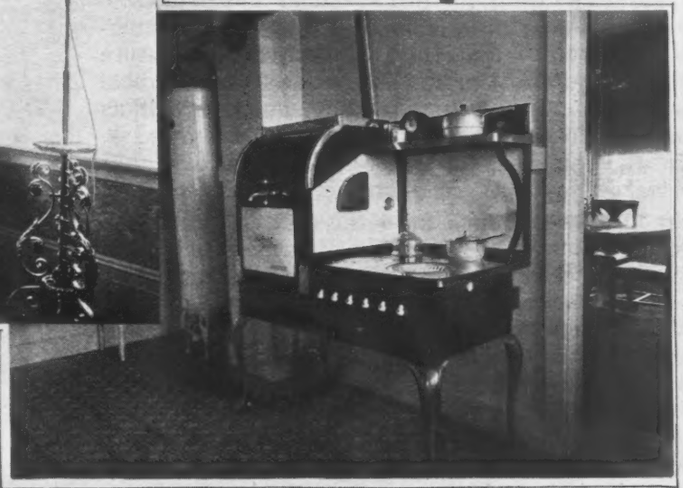
The theory that the cost of electric heating is excessive is disproven in the case of the Merritt Grand Apartments, which are totally heated by electricity. The average monthly cost of heating a single apartment is $3.66, based on the bills for a period of a year. During November, December and January the average bills were $7.48, $7.26 and $8.14 respectively, while the bills during the summer months averaged $0.75 per apartment. The average monthly revenue derived by the central station from the heating installation in this apartment house is $40.90 while the average revenue per kilowatt per month is $1.28. The apartment house contains 12 apartments and has a total connected load (heating only) of 32 kw.

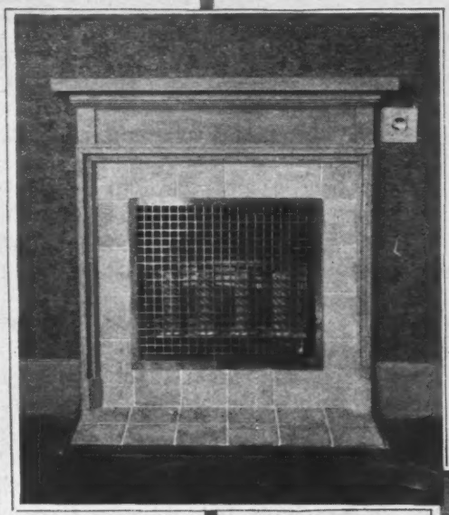
A Complete Electrical Installation

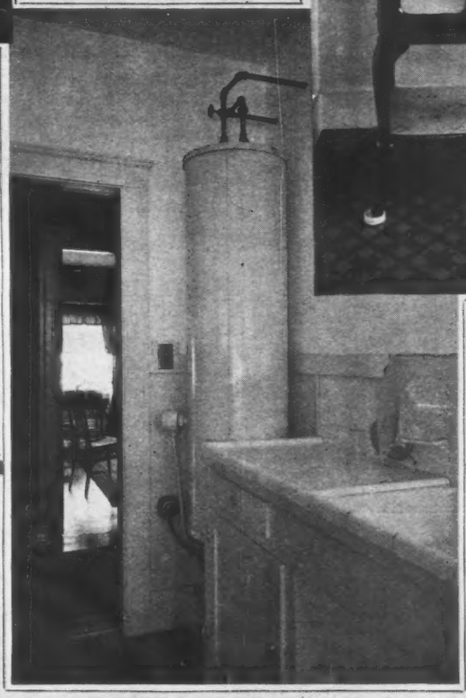
A real demonstration as to the practicability of a complete electrical installation in an apartment house is the Kisich Apartments in which electricity is used for lighting, cooking, water heating and air heating. The building contains two 4-room apartments, two 3-room apartments and one 2-room apartment. In each apartment the range, air heaters and lights are served through one meter and the water heater through a second meter.

A summary of the monthly consumption for each apartment during the six winter months from October to March, inclusive, shows that the tenant









INSTALLATIONS such as these in the apartment houses of Oakland, Calif., are spreading the message of electricity in the home. Hot water, heat, lights, and cooking with all of these conveniences and cleanliness of electricity for less than twelve dollars a month constitute a strong argument from the apartment house owner's standpoint. Each passing month sees more electrified apartments being erected.

paid an average of $11.60 per month for this service, $8 of which was the cost of operating range, air heaters and lights and $3.60 of which was the cost of operating the water heater. The range in the average monthly bills is from $7.85 to $15.60. The largest bill paid by any of the individual consumers during the six-month period was $21.48. The total connected load for the five apartments is 67 kw.

In the apartment house owned by Eva G. Hutchinson at 412 Staten Street, every electrical feature which goes to make a dwelling modern and desirable has been incorporated. This building, as well as many others in Oakland, was constructed by Fred A. Muller, a builder who has recognized the part that electricity is to play in the modern home.

From the standpoint of the central station, the electrification of the apartment house is highly desirable for several reasons. Primarily it means more load, and more load means increased revenue. It can be assumed, generally, that a range load will produce in revenue approximately $0.75 per kilowatt connected per month, a water heater load approximately $2.00 per kilowatt connected per month and an air heating load $1 per kilowatt connected per month. Furthermore, the revenue derived from this type of load is commensurate with the cost to serve an equal load of another character. As in the case of electric appliances the greatest benefits will accrue from a more complete saturation of the distribution lines of the central station with range, water heater and air heater load.

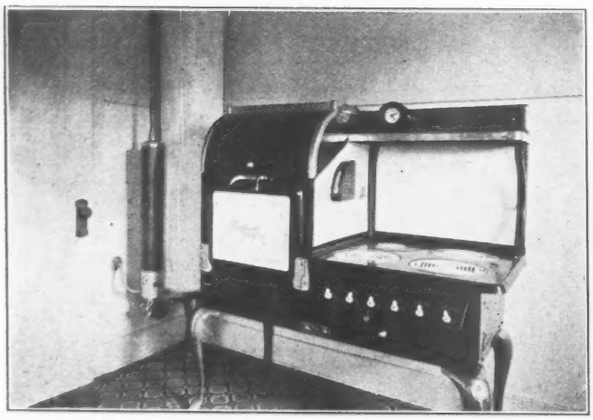
Diversified Character of Load

Another of the basic reasons which makes load of this type highly desirable for the central station is its extreme diversity. In practice it has been found that, in the case of a large range installation, the transformer capacity required to serve this load need be but 20 per cent of the total connected load. Thus the Como Apartments, mentioned before, with a total connected load of 259 kw., are served by a 50-kw. transformer. A load curve over a period of a week shows a maximum demand for this installation of 28.8 kw. Similarly it has been found in actual practice that the diversity factor for an air heater load is approximately 25 per cent. It is readily seen then that such a load, on account of its diversity, does not appreciably affect the peak as would be the case of an equal installation of motors. Moreover, the demand is such that in many cases it tends to fill in the valleys in the load curve. While the above reasoning applies to ranges, air heaters and water heaters in general, there are further considerations which make a complete electrical installation in an apartment house even more desirable. Because the load is concentrated in one building, construction costs are less than would be the case if an equal number of individual installations were made in one district. Similarly the cost of overhead, meter reading, collections and servicing is reduced.

The electric range—so simple a child can operate it.

From the sales standpoint, an apartment house installation requires only slightly more sales effort for a group of from five to twenty ranges and water heaters than is required in placing an installation in one individual home. Furthermore, because of the transient nature of apartment house tenants a completely electrified apartment is particularly beneficial to the entire industry, for tenants who have once used electricity for cooking, air heating and water heating will demand that service wherever they go.

Taking the experience of the past as a criterion, it is apparent that the complete electrification of the apartment house offers a profitable and desirable field for central station, manufacturer, jobber, contractor and dealer.



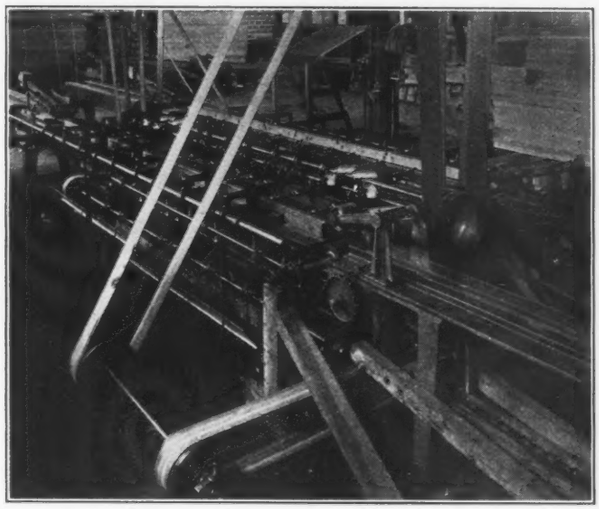
Range and water heater installation in one of the kitchens.

One of the completely electrified modern apartments.

Modern Automatic Machinery Aids in the Manufacture of Crossarms

MANUFACTURING wooden crossarms in such quantities that it has been able to get into the national market for this equipment has been the work of the Barnes-Lindsley Manufacturing Company, of Portland, Ore. This company started the manufacture of wooden crossarms for distribution and telephone lines in 1908 and since that time has made rapid strides in the development of its plant.

To be able to turn out a sufficient number of crossarms daily the company was forced to secure a new machine to be used in the boring and shaping



Augers on the automatic crossarm boring machine, pictured above, bore on the forward and return strokes of the carriage.

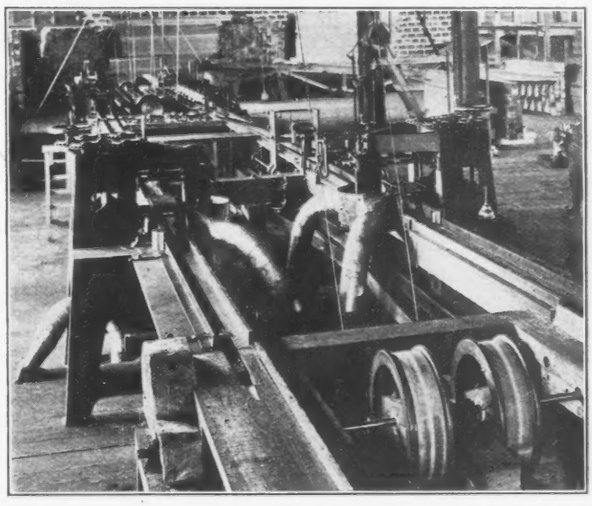
of the wooden arms, as this process is the factor which determines the speed of the entire plant. The president of the company, seeing this need for a specialized machine, invented and patented a new machine which has augers capable of penetrating twenty-four 4-ft. crossarms a minute. This same machine also has an attachment which shapes the planed crossarms, after they have been bored for pins and for bolts.

In the manufacture of this wooden pole line equipment, the lumber must first be seasoned in dry kilns and is then run through planers to secure the exact widths desired. When planed the arms are cut to the customary lengths, by circular cut-off saws, which are so arranged that the lengths being sawed may be altered by a changing of the stops on the saw tables. From the saw tables the material is taken to the boring machines, which are the only ones of their kind in existence.

The boring machines are entirely automatic, the only attendants necessary being two men to feed the half-finished crossarms onto the conveyor belts leading into the machine. The crossarms are moved, by the belt, into the machine the proper distance and are then stopped automatically and the boring starts immediately. Augers are located on two sides of the machine and boring is done on both the forward and return stroke of the carriage. Holes for the bolts, which are used to attach the arms to the poles, are also bored at this time, by augers which operate from below. The holes that are bored laterally are for the pins. The boring machine has a capacity rate of 11,500 finished crossarms per eight-hour day. This number is equivalent to two carloads.

From the boring machine the crossarms are conveyed on an endless belt to the shaper which is operated by compressed air. In this machine the crossarms pass under a trip device which releases a hammer that falls and brands each arm. As the arm clears the trip the first set of swinging shaper heads is released and these heads shape one end of the arm. When the first set of heads has done its work, the tension releases and the arm passes on to where the second set falls on the arm and shapes the other end. The center section of each crossarm is not rounded so that the arm may be bolted flush against the pole.

It is only because of the automatic machinery installed in the plant that the Barnes-Lindsley Manufacturing Company is able to compete with crossarm manufacturers throughout the United States and Canada. The specialized equipment installed in the plant is driven largely by electrical motors. This plant shows how modern electrical equipment and



Crossarms move from the boring machine on an endless belt to the shaping heads, in the foreground of the picture, and are there rounded by shaper knives operated by compressed air.

modern machinery can work together to turn out a product in sufficient quantities to enable the manufacturer to compete with eastern manufacturers in their own territory.

The Midway Plant of the San Joaquin Light & Power Corporation

By E. A. Quinn
General Superintendent, San Joaquin Light & Power Corporation

TO efficiently serve its customers the progressive central station must take advantage of every natural resource. The presence of large quantities of natural gas developed as a byproduct from oil wells in its district had a definite bearing upon the locating of a steam-electric plant of the San Joaquin Light & Power Corporation at Buttonwillow, Calif. The low cost of the gas enables this company to supplement its hydroelectric power with the energy generated in this steam plant.

THE Midway Power House of the San Joaquin Light & Power Corporation is situated at Buttonwillow, Calif., on the Bakersfield-McKittrick branch of the Southern Pacific Railroad Company, approximately 25 miles west of Bakersfield. This situation was selected for various reasons, some of which were its proximity to the Elk Hills gas fields, its location on a railroad and an 8-in oil pipe line, and the fact that it was known that suitable water in large quantities could easily be obtained. The property itself consists of 115 acres. The power house and operators' cottages are located on the south 35 acres which face a paved highway.

The ground was broken for the first unit Aug. 16, 1920, and the turbo-generator was placed in service the first week of June, 1921. Ground was broken for the second unit Feb. 12, 1922, and the turbo-generator was placed in service Aug. 1, 1922. Each unit has a capacity of 12,500 kva., generating at 11,500 volts.

The power house building is of steel frame construction. The walls are reinforced concrete except the west wall which is hy-rib and plaster. This wall is of temporary construction, to be removed in the event of future extensions. The roof slab is reinforced with electric weld fabric and is overlaid with a five-ply white top asbestos felt roofing. Treated concrete floors are used throughout the building with the exception of the turbine gallery floor which is checkered steel plate. The turbine room is 160 x 40 ft. The two units are placed longitudinally with their axis in one line. The two steam jet air pumps are on the same floor level as the generators. The turbine driven circulating pumps, exciters, boiler feed pumps and control sets are located on the ground floor. The motor and turbine driven hot well pumps are located in pits at the end of each condenser. A standard gage railroad track runs into the turbine room, permitting the unloading of heavy pieces of equipment by means of an electric traveling crane, having a capacity of 50 tons and operated at 440 volts a.c.

Boiler Room Equipment

The boiler room is 200 x 70 ft. and contains space for 16 boilers. At present it contains eight Stirling boilers, each having 8,224 sq. ft. of heating surface, and six Connelly boilers of 8,250 sq. ft. capacity, arranged in batteries of two boilers each. The boilers are the Class M, No. 30 with 48-in. mud drums and three 42-in. steam drums. The tubes are 2¾ in. in diameter, No. 8 gage. All boilers are equipped with the San Joaquin gas burners and Hammel oil burners. The oil burners installed are to be used in emergency in case of a break or other interruption to the gas line. The Stirling boilers are fitted with B & W. superheaters designed to superheat the steam to 125 deg. F. The Connelly boilers are fitted with Foster superheaters designed to superheat the steam to the same extent. The working pressure is 260 lb. The boilers are equipped with Diamond soot blowers, which would come into service in the event of the use of oil. The stacks are 90 in. in diameter and extend 120 ft. from the concrete foundation at the ground level. One stack is provided for each battery of boilers and each stack rests on a breeching common to each boiler.

The electric switch gallery is 160 x 18 ft. The switchboard room and bus compartments are of reinforced concrete. Steel window sash and doors are used throughout the building, making it an absolutely fireproof structure.

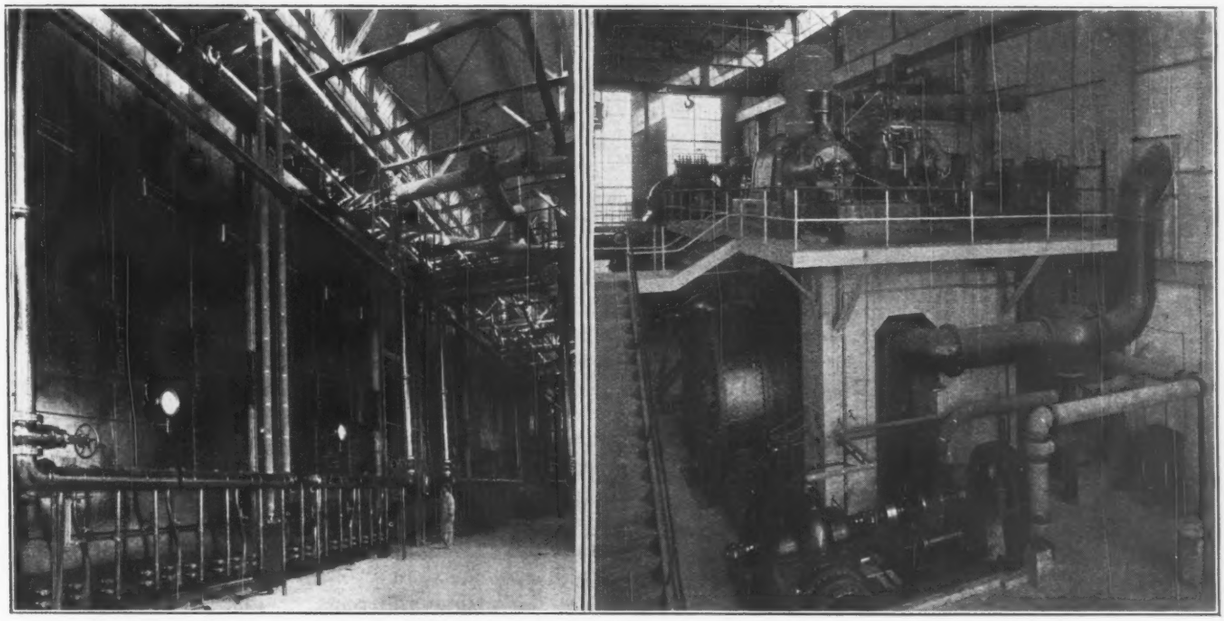
One ton per square foot was allowed for all building foundations. Using this low factor gives a very large safety factor, as the top strata of the soil, 4 ft. in thickness, is a hardpan which has 6 ft. of compact sand and clay underlying it. On account of the water rising within 12 ft. of the ground surface, it was necessary to use piling for the turbine foundations, the piling being driven to an evarage depth of 22 ft. In each turbine foundation, the piling was allowed to extend 18 in. and a reinforced concrete mat 24 in. in thickness was poured, making a very substantial construction to support the turbine foundations. The foundation for the turbines is of reinforced concrete rising 16 ft. above the ground floor level. The boiler settings are supported by a mat of concrete 30 in. in thickness, reinforced with old railroad steel. Each boiler requires 110 yd. of concrete and the reinforcing was placed where the greatest weights were to be sustained.

Two Turbo-Generators Are Installed

The No. 1 turbine is a horizontal Curtis type, operated at 1,800 r.p.m. It is designed for 250-lb. pressure and 125-deg. superheat. The generator is a three-phase, 60-cycle, 11,500-volt machine, rated at 10,000 kw. at 80 per cent power factor. The tur-

bine is connected to a three-pass surface condenser, containing 30,000 sq. ft. of cooling surface. The tubes are 1 in. in diameter and 20 ft. 2 in. in length. They are seamless drawn Muntz Metal and this composition is also used for the tube sheets. The condenser is provided with a 24-in. double suction volute pump capable of circulating 24,000 gal. of water per min. and is connected through reduction gears to a 400-hp., two-stage Curtis steam turbine. The air is removed from the condenser by a Wheeler steam jet air pump.

The No. 2 turbine is an Allis-Chalmers type, operating at 1,800 r.p.m., designed for 250 lb. pressure and 125 deg. superheat. The generator has the same characteristics as the one connected to turbine No. 1. The turbine is connected to an Allis-Chalmers three-phase surface condenser containing 30,000 sq. ft. of cooling surface. The tubes are 1 in. in diameter and 19 ft. 2 in. in length. The tubes and tube sheets are of Muntz Metal as in the No. 1 turbine. The condenser is provided with a 24-in. double suction volute pump capable of handling 24,000 gal. per min. and is connected through reduction gears to a 475-hp. Allis-Chalmers steam turbine. The air is removed from the condenser by a Croll-Reynolds evactor. Two 4-in. single stage volute pumps are provided for each condenser to remove the condensate, one pump being connected to a 25-hp. steam turbine and the other to a 25-hp., 440-volt motor. A 30-in. double suction volute pump capable of handling 25,000 gal. per min., connected to a 400-hp., 2,300-volt motor, is held as a reserve. The piping to this pump is so arranged that the pump can be used on either unit in case of failure or trouble of either of the steam driven circulating pumps.



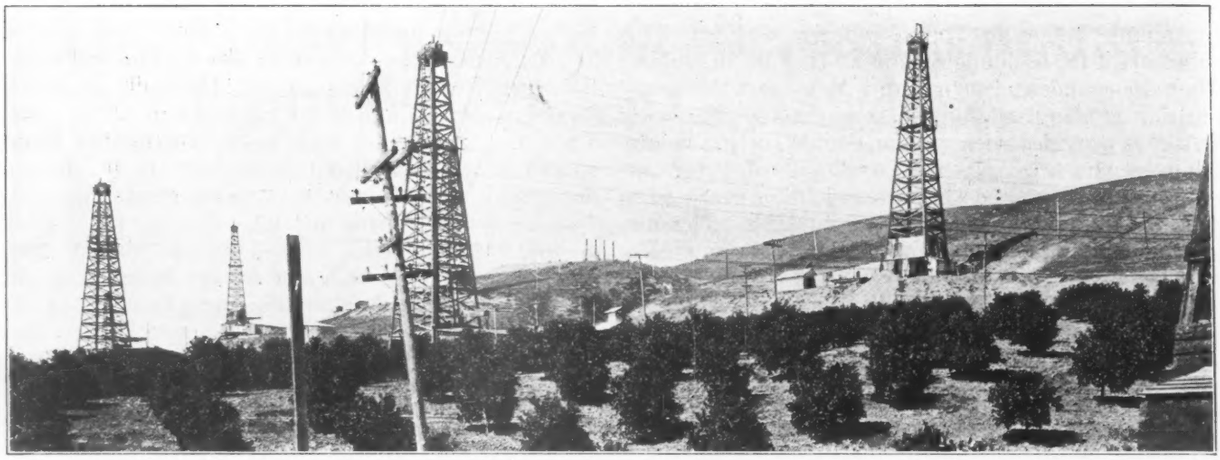
Boilers and steam turbines at the Midway plant. Natural gas is burned under these boilers by specially designed burners.

Circulating Water Is Re-cooled for Use

As all water for this plant is obtained from wells, it has become necessary to re-cool the circulating water and use it over and over again. A spray cooling pond is provided for No. 1 unit. This pond is 190 x 290 ft. and is 4 ft. 6 in. deep. The walls and floor are of reinforced concrete. The walls are cantilever type, 4 in. thick at the top and 6 in. at the floor. They are reinforced with $\frac{3}{8}$-in. corrugated bars, spaced 9 in. vertical and $\frac{3}{8}$-in. bars 12 in. on the horizontal. The floor is 4 in. thick reinforced with 2-in. mesh No. 16 wire netting. The sprays consist of 360, $2\frac{1}{2}$-in. nozzles formed in clusters of five nozzles each. The main pipe header tapers from 30 in. to 12 in. and the laterals taper from 10 in. to 6 in. No valves are provided to sectionalize the sprays, as the expense of installing valves was a large item and the result which could be obtained would not justify the expense. The sprays are designed for 25,000 gal. per min. with 6-lb. pressure at the nozzles.

For the No. 2 unit a cooling tower was built. The pond of the tower is 190 x 312 ft. and is 3 ft. 6 in. deep with the same type of walls and floor as the spray pond. The tower is 24,000 sq. ft. in area and consists of fourteen towers, each 10 ft. wide, 180 ft. long and 24 ft. high with 12-ft. spacing between towers. Each tower has seven sprays with 3-ft. spacing between trays and 6 ft. between bottom tray and floor of the pond. Copper nails and brass bolts were used throughout.

High pressure steam piping was designed for 550 deg. F. All pipe is extra heavy steel with wrought steel Van Stone type flanges. All fittings are cast steel and valves are cast steel with Monel metal trimmings. Boiler feed piping is designed for 230 deg. F. 275 lb. working pressure. Pipe is extra heavy steel galvanized after being flanged. All pipe over 3 in. has semi-steel Van Stone type flanges. Fittings are extra heavy semi-steel and valves are semi-steel with bronze trimmings. Blow off pipe



Natural gas to fire the boilers of the Midway plant is secured from oil fields of this character. Electricity generated at the plant is then transmitted to the oil fields and is used in pumping and drilling wells that more oil may be secured.

piping is extra heavy steel, galvanized after having been flanged. The circulating piping inside the building is cast iron; outside the building, riveted steel plate. The discharge pipe to the spray pond is 30 in. in diameter and the one to the cooling pond 36 in. The suction lines are 30 and 36 in. The atmospheric relief lines are 30 in. in diameter and are of riveted steel plate.

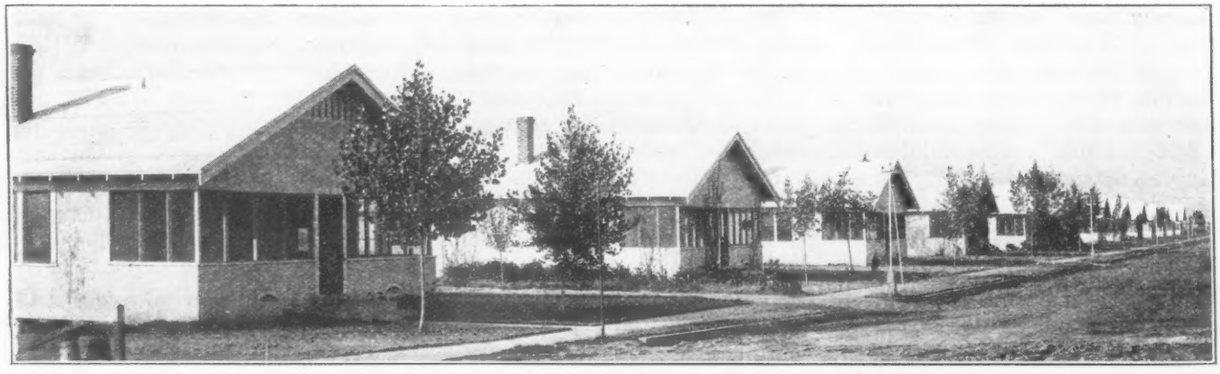
Water Obtained from Deep Wells

Water for all purposes is secured from wells sunk on the property and are known as Nos. 1, 2, 3, 4, 5 and 6. No. 1 is 548 ft. deep; No. 2, 289 ft.; No. 3, 365 ft.; No. 4, 442 ft.; No. 5, 388 ft.; and No. 6, 467 ft. deep. All the wells have 12-in. double casing, the upper 80 ft. of Nos. 1, 2 and 3 is 16-in. casing. This size casing was installed in order to use deep well pumps, if this should be found necessary. The wells are of the open bottom type with the casing perforated at the water strata.When conditions of the soil warranted it, a very careful log was kept of each well while the casing was perforated at the best water sands. The water is soft, containing a very small quantity of salts, and is used in the boilers untreated and requires but very little compound to keep the scale down to a minimum. All wells are landed in hard clay and the wells drilled through to sand. The wells develop 500 gal. per min. with the exception of No. 1 which develops 750 gal.

In order not to overwork the wells, pumps having a smaller capacity than that of the wells are installed. No. 1 well is served by a 700-gal. deep well pump and is only used in emergency; Nos. 2 and 3 are connected to one 750-gal. volute pump; Nos. 4, 5 and 6 are connected to a 1,000-gal. volute pump. All the pumps are motor driven.

The main pump house is of reinforced concrete construction and has a 12-ft. pit. The pump for Nos. 4, 5 and 6 wells and two 500-gal. booster pumps are located in this pit. A motor driven deep well pump is on the upper floor of the pump house. The booster pumps are operated by float switches installed in a 20,000-gal. steel tank which has an elevation of 60 ft. The water from this tank is used for make up, cooling and domestic purposes. A 12 x 7 x 10-in. duplex fire pump, which is used principally for boiler cleansing and tests, is installed in the boiler room. This pump has a double suction line; one takes the water from the 20,000-gal. tank and the other from the cooling pond. This gives a large supply of water in case of fire.

On account of the compactness of the sand underneath the hardpan, it has been found practically impossible to dispose of water by seepage. The cooling water from the transformers and oil coolers, and also the heater overflow are discharged into the cooling pond. Cooling water from the auxil-



A row of cottages erected by the San Joaquin Light & Power Corporation for operators stationed at Midway steam plant.

iaries and the blowoff water from the boilers is finally discharged into a concrete sump. The concrete sump is pumped out by a 200-gal. per min. vertical sump pump driven by a motor and controlled by a float switch in the sump. The water is finally discharged to a ditch which carries off any overflow.

Boilers Are Fired with Natural Gas

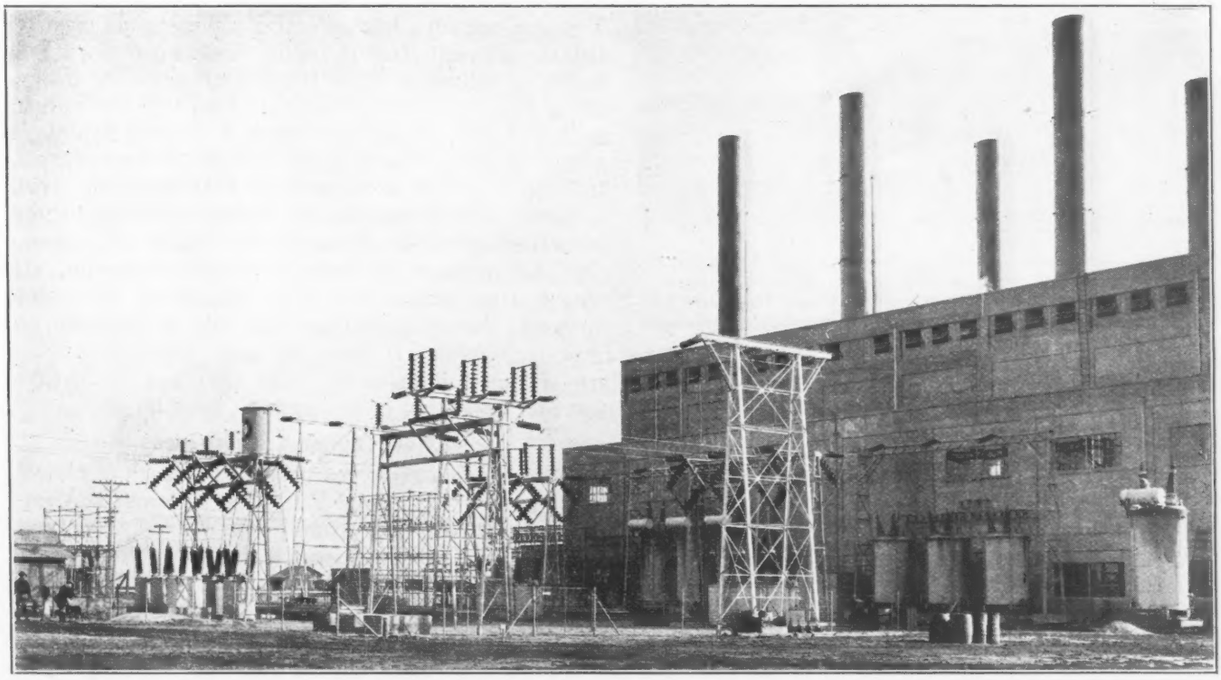
Natural gas has been used exclusively in this plant up to date. The gas is piped direct from the Elk Hills oil fields to the power house. The gas line is 10-in. extra heavy casing and is 9 miles in length. It carries a pressure of 250 lb. which is reduced to a 75-lb. pressure. Just outside the plant is a metering station where the pressure is again reduced from 75 lb. to 25 lb. The gas then flows through the metering station and is again reduced to one pound pressure, or whatever pressure is required for the furnaces, depending on the load being carried on the turbines.

Two differential recording gas meters, recording thermometer and a 0 to 15 lb. recording pressure gage are provided for each gas measuring station. In the 8-in. vertical leads from the main gas header to the burner headers are installed 4-in. orifice meters and differential gages. The stations for the firemen are equipped with recording gages showing pressure on main gas header; recording steam gages, master steam gages, indicating gage showing temperature of boiler feed water. Indicating polyphase watt meters showing the load carried on each turbo-generator are also installed in each fireman's station. The boilers are equipped with Bailey boiler meters and the main steam header is equipped with recording thermometer, recording steam gage and an indicating steam gage. On the same panel is a recording vacuum gage and a mercury column vacuum gage. Recording thermometers and pressure gages are provided for inlet and outlet of the circulating water through the condensers. Recording thermometers are provided for the condenser hot wells. Condensate from the condenser is measured by Venturi meter tubes and the condensate from the heater is measured by a recording "V" notch meter. Recording thermometers are provided for the boiler feed lines. Two Mono CO_2 recorders are installed in the boiler room.

The Electrical Equipment Installed

The main switchboard consists of a ten panel bench board with remote control solenoid-operated oil circuit breakers. The 11,500-volt circuit breakers are in concrete cells. The 120,000-volt circuit breakers are of the outdoor type and are located in the high tension switching yard. The 120,000-volt line switches are protected by instantaneous overload and reverse power relays. All transformer automatic switches are protected with differential relays, and the 11,500-volt circuit breakers are protected with inverse time limit relays. The generators are protected by differential relays. The auxiliary switchboard consists of five vertical panels; four sections are for the exciters and one section is for station power and lights. All bus work is open and in concrete cells.

The cottages for the operating crew are located at the west end of the property. There are twelve modern 4-room stucco cottages with built-in features. Lots are 75 x 175 ft. Stucco garages 14 x 20 ft. are located at each cottage. A 6-room cottage is located in the north end of the row of cottages, and is used as a dormitory. Natural gas is used as fuel in all the cottages. The cottages have been arranged with particular attention for the comforts of the occupants during the summer months, and a big roomy screen porch runs the full width of the house.



High tension transformers and switching equipment installed at the Midway steam plant, located at Buttonwillow, Calif.

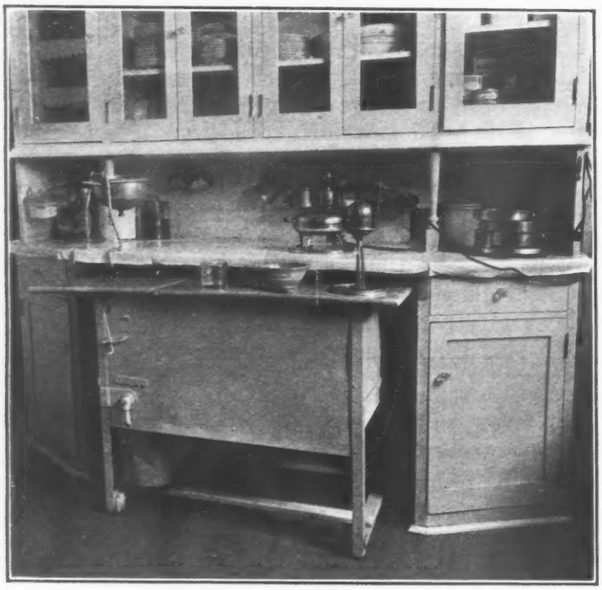
Getting a New Angle of Approach to Sell Electric Appliances

By J. E. Bullard

THERE is a department store that is making one of the very best records in the country in selling fireless cookers. It is making such a good record that those who have never investigated the case are inclined to believe that the company uses rather spectacular sales methods.

As a matter of fact, it is one of, if not the most conservative store in its city. Nothing of a spectacular nature is done in an effort to increase sales. Window displays of the cookers are made but four times a year and these displays remain in the windows but three days each.

Perhaps the cookers are mentioned in the store's advertising twenty times during the year and only four demonstrations are held. There are a great many stores selling far fewer cookers who appear to



The electric dishwasher salesman who can suggest an arrangement similar to this for disposing of the machine when it is not in use, will be nearer to closing the sale than one who merely suggests that the device will only wash the chinaware.

be placing much more sales pressure behind them, yet sell a much smaller number of cookers.

At first thought there seems to be no reason why this store should be so successful in the selling of fireless cookers. A talk with those who actually do the selling, however, soon explains their success. These people are practical enthusiasts.

Salesmen waste no time in telling the people how much fuel the cookers save. They devote their attention to pointing out what results can be obtained in cooking. They always stand ready to prove every statement that they make. They are always seeking some new way to use the cooker for cooking purposes. These new ideas for using the cookers are passed on to prospective customers. People are invited to put up to them the most difficult cooking propositions so that the salesmen may solve these problems. A favorite performance is to get people to bring in old tough fowls or tough cheap cuts of beef and to cook these in the cooker, making them tender and palatable.

It is the thinking up and the carrying out of these sales-making performances that is meant by the expression, practical enthusiasm. The people who sell the cookers are enthusiastic about what can be done with them but they are working in a store where extravagant statements are not tolerated. As a matter of fact, it is often necessary to prove statements to the executives of the company. This proving of the statements, this policy of the store that no extravagant statements are to be tolerated has resulted in the sale of a great many cookers to the executives and the employees of the company.

The electrical industry has been built up very much along these lines. There would not be nearly as much electric power sold today were it not for the fact that the foundation for these sales was laid by practical enthusiasts. The same has been true of lighting, of heating and of appliances.

The great multiplicity of articles now offered for sale, however, tends to reduce this enthusiasm. It is assumed that people know more about them and it does not require so much enthusiasm to sell them. Yet just consider how effective the methods used by this department store in selling fireless cookers would prove in selling electric ranges. Practically everything this store does can be done by the person selling electric ranges, for the cost of operation plays a very small part in making sales under this system. It is just a case of something that does the work so much better, that makes a person willing to pay more for operation if necessary. After all, people are looking more for value than for economy. If they can be shown that they are getting full value for what they pay, the amount paid is not such an important item. If they are not shown that they are getting full value for what they pay, then first cost and operating costs begin to loom large.

Use New Demonstration Ideas

There are a great many ways in which electrical appliances can be used. Yet when it comes to demonstrating them, it is usually the most obvious and only the most obvious ways that are shown. A vacuum cleaner demonstration, for example, ordinarily consists of placing a rug on the floor, sprinkling it with starch, flour, salt or some other white substance and then cleaning the rug. This form of demonstration has been carried on so long that it

has lost much of its force. Instead of people standing around with open mouths watching it operate, they are more likely to point out to each other the weak points and the defects of the cleaner, or the demonstration.

Yet a vacuum cleaner is ideal for any air suction or blowing purposes around the home. If it is desired to blow the dust out of inaccessible places in a sewing machine, a typewriter or anything else, the vacuum cleaner can be brought into service. There are hundreds of different duties, not ordinarily thought of in connection with the cleaner, that it can perform. Practical enthusiasm means searching out these ways and demonstrating them to customers. Doing this means an increased sale of cleaners.

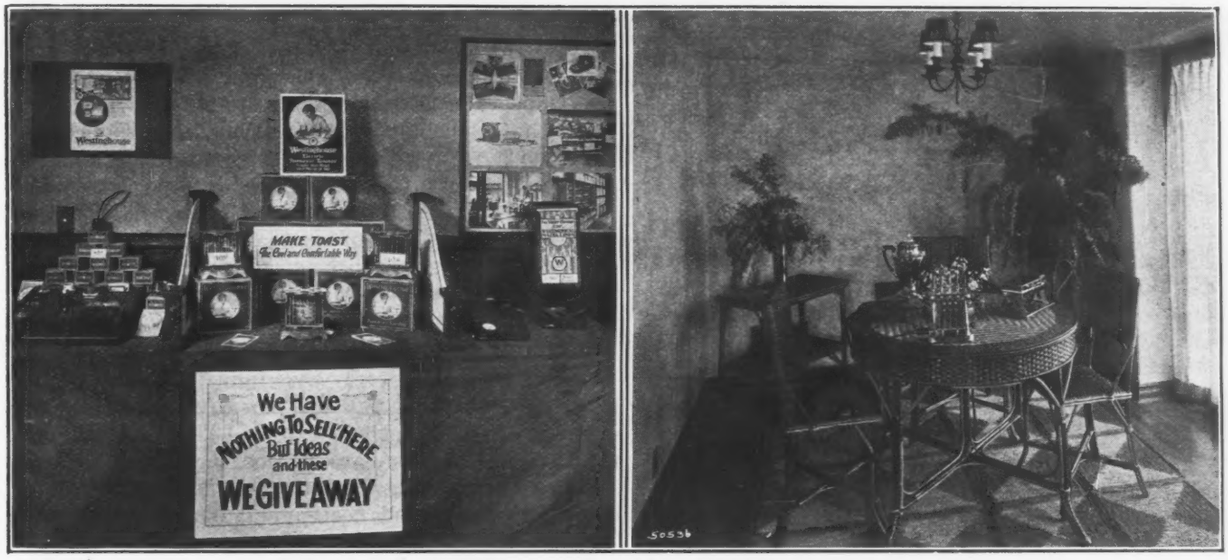
The vacuum cleaner salesman who, when he enters the home to make a demonstration, instead of starting to clean the carpet—something that can be done with a hand carpet sweeper or suction cleaner—begins to clean the ceiling, extract the dust from behind the picture molding or does some other work to which the cleaner is admirably suited, stands a good chance to make a sale where he would not if he devoted his attention solely to the carpet. The chances are that the carpet has been cleaned repeatedly with a vacuum cleaner and that this demonstration has always failed to make a sale. A new use must be found before the sale can be made.

Give New Utility to the Product

If enough new decorative ways are found for using Christmas tree outfits and these ways are demonstrated, these outfits can be sold the year round, and as soon as they are made a year-round product a number of people, who will not buy them merely for Christmas use, will begin to spend their money for them. It is merely a matter of what we may call practical enthusiasm.

There is not an appliance sold that cannot be used for many purposes other than the ordinary ones. Finding and telling the people about these uses goes a long way toward selling them.

Soap and other manufacturers have found it profitable to find out the different ways people have used their products. When they have learned of these ways, they have in some cases changed their products to fit the odd uses better. In any case they have usually passed on the new and odd uses to the people. People will buy the product for the new and odd uses when they might not for the common, ordinary use. The same holds true with everything that is made. Some new and novel use, something a little out of the ordinary is always certain to make a strong sales appeal.



Electrical expositions and electric home displays have done a great deal to increase the knowledge of the housewife in regard to what electric devices will do for her in her own home.

Odd Uses Increase Sales

It is exactly the same as in the case of the fireless cookers. One of the most important reasons why the store is so successful in selling them is because it features out-of-the-ordinary uses. The company is constantly searching for new ways of using cookers. No one can suggest any use to these people, that they do not test out and find out for themselves if it is practical.

The time and energy that have been used in this direction most certainly have not been lost. The sales record shows that. The work has been very largely a matter of having a little real enthusiasm for what is being sold. It has been a matter of not being satisfied with learning about new uses but of testing out their practicability and then passing on the results to the customers.

Exactly the same thing can be done in the sale of electrical appliances much more than it is now being done. The result is bound to bring a very material increase in sales, and will probably lower selling costs considerably.

ELECTRICITY IN INDUSTRY

By Louis F. Leurey
Industrial Electrical Engineer

Importance of Neatness in Industrial Electrical Applications

THE electrical profession generally and often inclusive of those actually engaged in industrial applications of electricity, does not possibly recognize the special importance of good appearance and neatness in the installation of electrical equipment and sources of electrical supply.

In recent years all of the broad-gaged managers of industrial establishments, and they now represent the large majority of the total group, have been

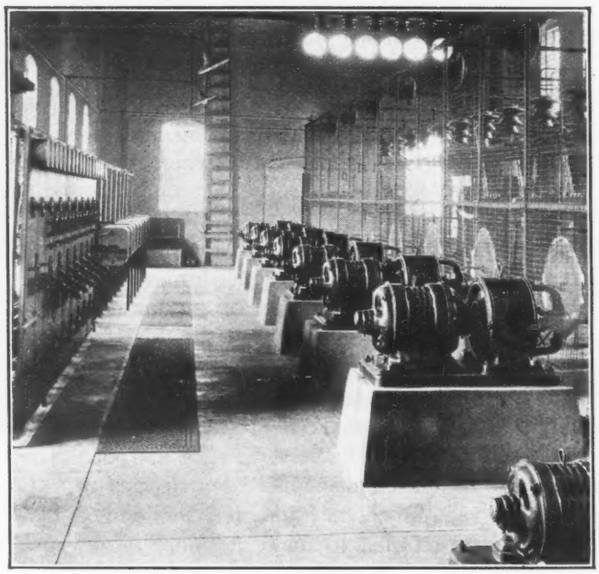
Switchboards similar to this are a credit to the industry.

more and more impressed with the value of architecture, correctness, cleanliness and all around neatness in the arrangement of their industrial plants. Many thousands of dollars have been spent by progressive firms on the Pacific Coast for the beautifying of their grounds, the handsome design of their buildings and the neat and sanitary arrangement of the interior of their plants.

It is to be regretted that the electrical industry has not in the majority of cases, fallen in step with this spirit of advance and it is to be noted that in many otherwise beautifully arranged industrial establishments, the electrical facilities stand out with a degree of bald ugliness which is not a credit to our industry.

From the purely utilitarian point of view of engineering necessity, a switchboard or a power service may function 100 per cent effectively and still be an eyesore from the point of view of physical appearance. Again, looking at a switchboard from the sole point of engineering, it really represents nothing more than a device to divide a large block of power into smaller and more convenient blocks for distribution within the plant. To the owner, however, it represents an entirely different thing and to him it must replace the former engine room which was the pride of our industrial establishments in the days when mechanically driven plants were the rule, rather than the exception.

To the manager of the industrial plant the switchboard is the physical manifestation of his entire electrical motive system. The members of the electrical industry are overlooking a most serious and important policy when they do not capitalize the owner's interest and design and install for him a



These motor-generators were installed for a smelter in the Northwest with a view to securing efficiency and neatness.

switchboard which is a source of pride, both to the manager and to the firms who design and install them.

It is indeed a sorry contrast in some industrial establishments to see the plumbing industry represented by beautifully arranged groupings of their appliances with a lavish use of marble and nickel

ware and to see in that same establishment a loose assortment of black metal cans mounted on a wooden frame and labeled "switchboard."

The electrical industry through all of its branches should take heed of this modern movement to beautify industrial establishments and see to it that electricity in all of its physical manifestations, through services, switchboards and equipments will be a credit to the industry, not only in effectiveness but in appearance as well.

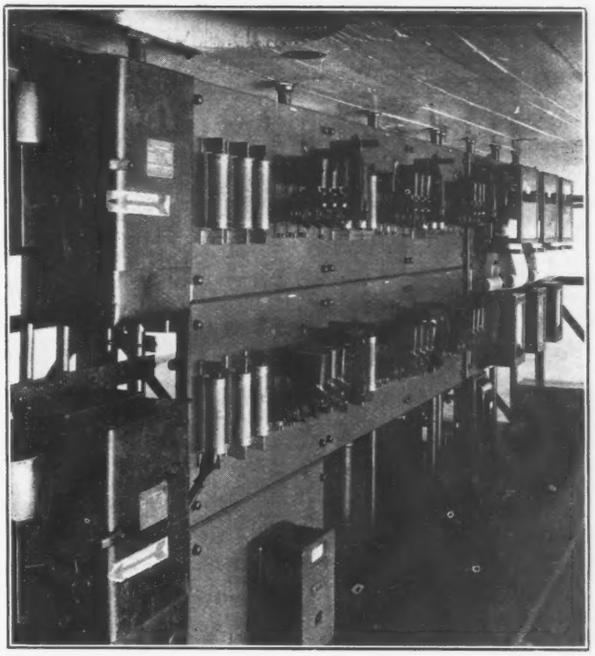
Applications of the Electrical Oven in the Automobile Industry

AT THE plant of the Durant Motor Company in Oakland, Calif., there is now in operation one of the most advanced and important applications of electric energy to oven problems that has yet been installed in the West. At this plant there are now installed two three-compartment body ovens, one chassis oven and one parts oven, having a connected capacity of approximately 2,000 kw. All of these ovens are being used in the japanning and finishing of motor cars or their component parts.

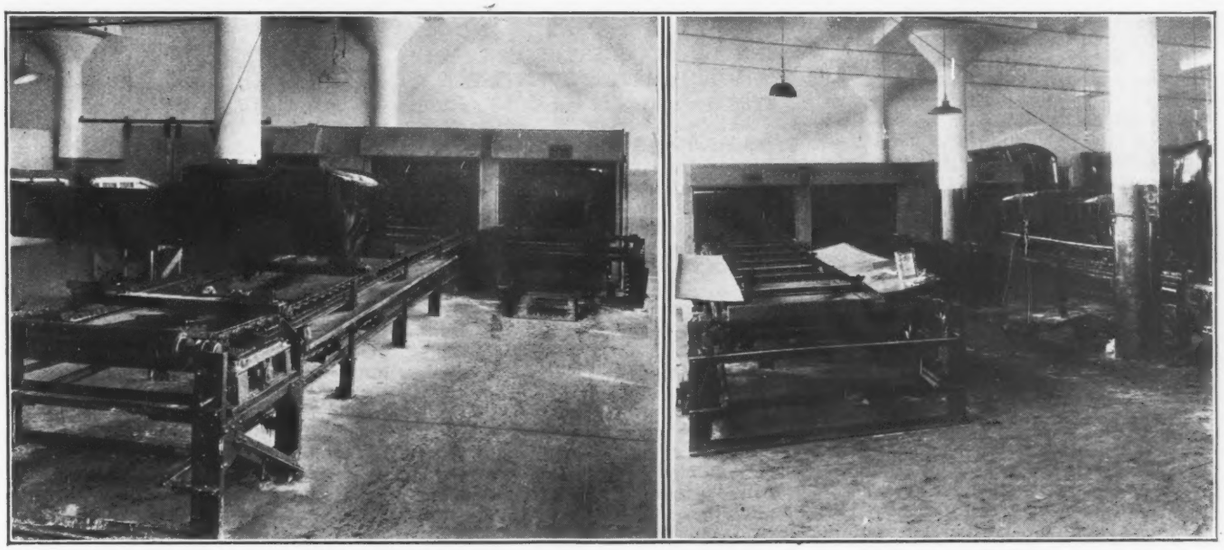
The heating units are of General Electric Company manufacture and are installed in a number of standard sizes and temperature gradients to suit the various types of work which are handled in this installation. In the three-compartment ovens each compartment is divided into two independently controlled temperature zones so that a total of six independently controlled temperature zones are handled from separate electrical circuits. The approximate length of these oven tunnels is 250 ft. for each of the three compartments.

The accompanying photographs show the two ends of the three-compartment oven and a section of the control board from which the equipment is operated. Special automatic control provides for uniform temperatures and operation.

The parts oven is used largely for enameling sheet metal parts of the Durant and Star cars, this type of equipment being principally composed of hoods and fenders. This oven is of the continuous conveyor type upon which the parts are loaded and after being loaded are dipped into a first coat tank and are then taken up through the first coat oven and thoroughly dried, after which the parts again descend into a dip and in succession are taken through the second coat oven. One of the interesting and vital parts of this whole installation is the nicety of temperature control which gives the electric ovens their special commercial effectiveness.



Section of the control board at the Durant assembly plant, Oakland, Calif., showing curve-drawing recording instruments.



The automobile bodies enter the three-compartment oven pictured at the left and are delivered from the other end of the machine, as may be seen in the right-hand illustration. Six temperatures are obtainable in this electrically heated oven.

JOBBER, DEALER AND SALES AGENT

Developing Business That Will Bring Repeat Orders

Commercial Illumination Offers Field from which All Branches of the Electrical Industry May Derive Profit

By REY E. CHATFIELD
Secretary-Manager, Electrical Service League of British Columbia

Securing business which calls for repeat orders or for similar orders from other sources is one of the sales problems met by the electrical contractor-dealer and all other men in the electrical industry. This form of business, which brings other business to the store, is the most desirable that can be obtained and it is the intention of every merchant to acquire it.

For the electrical contractor-dealer, show window lighting presents this opportunity, for once that a store in a business block is supplied with correct illumination, the other establishments to protect their business, install equally as attractive window lighting units. Getting the original foothold in the business district is the most difficult part of the sales program. In securing the first business for commercial lighting installation, cooperative effort will often prove to be to the advantage of all concerned, namely, contractor-dealer, central station, and manufacturer of lighting equipment.

Selling to the Industry

Unfortunately, electrical men must be sold the idea thoroughly first, before progress can be made. Ordinarily an electrical contractor or fixture dealer in selling fixtures and the necessary wiring installation for an illumination job sees only so much wire, pipe, etc., and so many fixtures, and he is apt to lose heart when the prospect questions price and the total runs into several hundred dollars. That man must firmly believe that he is not selling fixtures, but that he is selling publicity. Good illumination is cheap publicity. If the salesman can convince his prospect that the proposed illumination installation is permanent publicity, the cost of which is less than the monthly or annual appropriation for newspaper advertising, he should have no difficulty in making a sale. In order that a prospect may be convinced on this point the salesman, whether he be contractor or fixture dealer, must believe in it implicitly himself.

Having sold the electrical industry this idea the propaganda and details of the scheme are fairly simple. The Electrical Service League in its campaign mapped the retail business district and from the central station obtained a mailing list of every user of electricity in that district. Then a series of three letters were multigraphed, addressed and signed as personal letters and sent out covering the retail district.

Letter No. 1

"MEN AND MOTHS ARE
ATTRACTED BY LIGHT

"You don't care so much about the moths, but you depend upon the men and women you attract to your store to increase your daily receipts, turnover and success as a retail merchant.

"Light is the beacon—not necessarily more light but light properly applied. The average store keeper today is not getting the returns made possible through recent developments in the art of electric lighting. Yet there is no greater stimulus to action on the part of the buying public than a properly lighted store.

"Under the glow of correctly located lamps and fixtures your merchandise will present a greater appeal. More accurate inspection of intended purchasers will be possible and quicker decisions by the shopper will result.

"Proper lighting creates more satisfaction among new customers and strengthens the good-will of all your patrons.—Let us show you how to do it.

"Yours for better lighting,
"SECRETARY-MANAGER."

Five days later the second letter was sent out.

Letter No. 2

"WHY DO SUCCESSFUL
MERCHANTS ADVERTISE?

"You don't have to guess the answer to that question—it is self-evident. Prospective customers read the advertisements—and become buyers.

"Do you realize that your show windows and the appearance of your store are worth more to you for publicity than pages of advertising? Newspaper advertising is read by about twenty-five per cent of the people who subscribe for or buy a newspaper. You can attract the attention of every passerby to your store **if it is properly lighted.**

"Do your windows give you full value as a proper medium for publicity? Have you made an attempt to find out? Fully fifty per cent of your sales to transient customers are made for you by your show windows.

"Our business is store and window illumination. Can we not make a survey of your store and advise you as to its proper illumination? Recently our illumination engineer found a business man on Granville Street using too much current to obtain the intensity of light he wished. By the installation of a proper reflector **he cut his consumption of energy in half and doubled** the intensity of useful illumination.

"Perhaps your trouble is similar to the trouble of that merchant. We offer you this service free—if you are interested phone Sey. 5000 and ask for Mr. ———.

"Yours for better lighting,
"SECRETARY-MANAGER."

Then letter number 3 was mailed.

Letter No. 3

"Dear Sir:

"A few days ago we wrote you a little note stressing the value of proper lighting for your store and show windows. Since that time we have acquired the services of Mr. ———, an expert in store lighting.

"He will call on you some time during the week of ——— to discuss your lighting. Improved lighting does not necessarily mean more light, but proper direction, diffusion and color of light. Perhaps you are using too much light. If so he will advise you.

"If you are interested in the illumination of your store we will be glad to draw up specifications and make recommendations for proper illumination without charge.

"Yours for better lighting,
"SECRETARY-MANAGER."

Before the third letter was mailed the retail area was divided into small districts. Through the cooperation of the central station, jobbers and contractor-dealers, salesmen were loaned to make the necessary follow-up calls.

As the letters were mailed each salesman was notified to make his scheduled calls. This salesman when he found an interested prospect offered to have a proper layout drawn, free of charge. Through the cooperation of the central station these layouts were drawn by their illuminating engineer and furnished the campaign manager. These layouts were forwarded from the League office with a sales letter applying to the particular store under consideration and the interested contractor-dealers were then advised that a certain prospect was interested in lighting and that a layout had been drawn for him. Contractor-dealers then called on the prospect to close the job. In this way, where the prospective purchaser declared no preference as to contractor, he had several men urging him to make the new installation.

The campaign so far has covered five hundred stores in an area of thirty-six city blocks and has resulted in from one to three new installations per block with the probability of this number increasing greatly.

Selling the Electrical Idea to Power Company Employees

As a part of the "Electrify" movement which is being fostered by the Joint Committee for Business Development, employees of the Edison Electric Illuminating Company of Boston have organized an Electrify Club, membership in which depends upon the degree of electrification in the homes of the employees. There are five officers in the club, a president and four vice-presidents, and these are determined by the extent to which they have electrified their homes. There are no dues, meetings, or obligations of any kind.

Electrification is measured in terms of points, and only those having a rating of at least 80 points are admitted. The minimum was raised from 75 on Feb. 1. So many points are given for outlets, appliances, etc., and in order to give those living in small houses the same opportunity as those occupying larger quarters, the wiring points are credited on the real estate basis. All consumption outlets, save switch outlets, are termed "outlets" no matter where they are placed. A chandelier counts as one outlet, and so do convenience outlets, cellar lights, porch lights, hall lights, bell-ringing transformers, etc. Bathrooms, halls, cellars, closets, etc., do not count as rooms, but the outlets in these places are considered.

The points are arrived at in this manner:

Wiring: Add all outlets, giving each a value of one except duplex convenience outlets, which are counted as two; divide by the number of rooms and multiply by 10. Thus a seven-room house with 21 outlets would have 21 divided by 7, or three outlets per room, receiving a point score of 30.

Appliances: The following appliances are listed at one point each, and where there are two or more of any one kind, no more than two are counted. Buffer and grinding set, Christmas tree set, cigar lighter, coffee grinder, curling iron, egg mixer, electric fan, electric phonograph motor, electric player piano, glue pot, hair dryer, heating pad, sewing machine, soldering iron, vibrator, violet ray machine, and any other appliance consuming less than 300 watts and not included elsewhere in the list.

The following count two points each, not more than two being counted: chafing dish, egg boiler, immersion heater, grill, milk warmer, pressure cooker, samovar, shaving mug, toaster, waffle iron, and any other appliances taking more than 300 and not over 600 watts.

The following count as two points each, and as many as three may be included: flatirons, radiators of the sunbeam type.

The following count as five points, and only one may be counted: electric ice cream freezer, electric fireless cooker.

Ten points are given for the following, and only one is to be counted: washing machine, vacuum cleaner, dishwasher, mangle with electric motor but not electrically heated.

The following count 20 points each and not more than one may be counted: electric range of over 1,000 watts, electric refrigerator, electric mangle with electric motor and electric heat.

The following count according to size: portable or table lamps, one point for each socket; electrically wired furniture, such as wired beds or tables, count one for each socket or convenience outlet.

Each month additional Boston Edison employees are enrolled in the club, and there is much enthusiasm shown by those who are anxious to join and those who want to see their point total grow larger. Increased sales of appliances to employees have resulted from the activity. The organizers of the club were L. R. Wallis, sales department; C. E. Greenwood, appliance department, and R. S. Hale, special research department.

ARE YOU ON YOUR KNEES?

By JOE OSIER

But recently, a friend of mine who, by the way, owns and conducts a small shop, specializing in appliances and fixtures, and—

Who works hours per day in order to keep the—

Celebrated wolf from the w.k. door—

Told me that he had despaired of ever becoming a coupon clipper—adding that he was ready to—

Toss in the towel, strap on his climbers and hike up the nearest pole.

He said: "I'm ready to concede that as an electrical contractor-dealer, I'm a fine hunk of Swiss. I'm a lame duck in the puddle. My chances for success can be compared to the chances of the—

"Tallow footed dog who chased the asbestos cat through the naughty word.

"My doom has been signed, sealed and delivered—the boys with the big shops and the elegant show windows saw to that and—

"All that remains for me to do is to take the air."

But before he started for his favorite corner where he was wont to put on the blubber act, I unleashed the following wise crack and he listened:

"The great only seem to us great because we are on our knees;

"Let us arise."

And further from me—"Rise, Brother and do your stuff. You have been blinded by the brilliance diffused from your competitor's windows. His display has shot you for a row of convenience outlets and—

"You are looking for a soft spot to light.

"Don't walk out on the game. Take my hunch and follow his example. If he can pack in the cash customers and shake the shekels from their one way pockets through a flossy window and up-to-date merchandising methods, why can't you do likewise?

"Your competitor is gathering the glue because he is doing business in the latest approved style—he is making a play for it; in other words, his fast ball is hopping all the time while you—

"And there are hundreds like you—play the bench and wonder why the game cannot be won."

And so on—until I saw his mad a-coming and then I beat it but—

A few days later I walked by his place of business and I noticed a great change had taken place. The 1896 fixture had been taken out of the window—the pliers and roll of tape and the carton of bulbs were gone and in their places were tastefully displayed a few, fine fixtures and several appliances which—

According to a small card, cost but a few cents per day to operate.

Looking inside the door, believe it or not, I saw several customers and they were being separated from something which reminded me of money—and—

This sight prompted me to speak right out: "How's the battle today, friend?" and—

My friend came back with: "The battle has just started but it will be the decisive one in the long war which is raging.

"From now on you can count me in until I'm counted out.

"The fodder is on me, come Tuesday noon."

Electrifying the Merchandising Figure of the Dealer

An electric light bulb is not so unlike a human head in shape—why could not a clever window display be made by painting eyes and nose upon some of them, arranging a body effect and show the bulbs (or these little figures) engaged in the household tasks that can be performed by electricity.

This is suggested by the heading drawn by a newspaper artist in Columbus, Ohio, in connection with a Sunday issue about the time an electrical show was held there recently. He drew little figures using bulbs for heads,—one sweeping, another cooking, one making coffee, another washing and still another doing the ironing.

Section heading which appeared in a Columbus, Ohio, newspaper the Sunday before the opening of the Electric Show.

Make It Easy for Prospects to Become Customers

During Sale Southern Electrical Company Accepts One Dollar as Initial Payment on Any Electric Appliance

"Make it easy for prospects to become customers" has long been one of the slogans of successful mail order houses. These firms have appreciated the value of the coupon attached to an advertisement and have been consistent users of this type of "action getter." Mail order houses usually stipulate that in using these coupons only a small initial payment, or quite often no payment, is required to secure delivery of the merchandise.

In mail order advertising, the copy is designed to first attract the attention of the reader, then interest him in the merchandise being advertised and finally the effort is made to create the desire for ownership in the mind of the prospect. After this desire is created the advertisement presents the "dotted line" upon which the reader who has been imbued with the desire of ownership can sign his name to secure the merchandise.

One of the reasons for the success of the mail order houses is the fact that they have made it easy for the prospect to buy, through their policy of supplying the coupon blank at the psychological moment. The prospect in securing the merchandise by sending either no money or only a small sum when the order is placed, pays the balance when the goods are delivered.

The electrical merchant, though usually not in a position to present coupons to prospects, can nevertheless make it easy for the prospect to become a customer, for he can offer low initial payments on his merchandise. In this respect he has the advantage over the mail order house, for he can spread the balance of the payments over a period of months thus giving the purchaser the advantage of the use of the appliance before the entire purchase price has been paid. The inducement of the low initial payment is often enough to complete the sale, in cases where it could not be done otherwise.

Electrical dealers and other merchandisers have found that a sale is made more easily if the first payment on the goods is not the full amount. The average purchaser would rather make a small down-payment and settle for the balance in monthly installments, for in many cases the full purchase price is not available at the time that the purchase is made. Thus the installment business has been found to be a profitable one for the merchandiser as it increases his yearly turnover. In addition, he secures a fair rate of return on the money tied up in merchandise which is covered by installment purchase contracts. If he carries these contracts himself, he usually secures interest in excess of seven per cent. If he sells these contracts to contract purchasing concerns he may still make a small profit on the discounting of the contracts.

The added turnover is the most important consideration, and it is principally because of this that the electrical dealer is interested in installment business. By offering electrical devices to prospective buyers for the payment of a small initial sum, which is to be followed by weekly payments arranged to suit the customer's circumstances, the dealer can greatly increase his business.

An example of how low the initial payments can be made, is given by the Southern Electrical Company of San Diego, Calif. That firm desired to make it extremely easy for the women of the city to install electric labor-savers and to do this inaugurated a campaign, whereby any electric device in the stock carried by the company could be secured by making a down-payment of one dollar. The plan of the campaign was to secure as many sales as possible by the policy of taking the extremely small initial payment for the delivery of any piece of equipment to the home of the purchaser.

To make this campaign a success, it was necessary to make a great number of sales. The Southern Electrical Company decided that, to secure the volume of sales necessary to insure the success of the idea, a considerable amount of advertising would be necessary. In planning this advertising several different forms were considered to be necessary. The values of the several forms of advertising which could be used by the company were considered and as a result it was decided to concentrate upon newspaper and poster advertising.

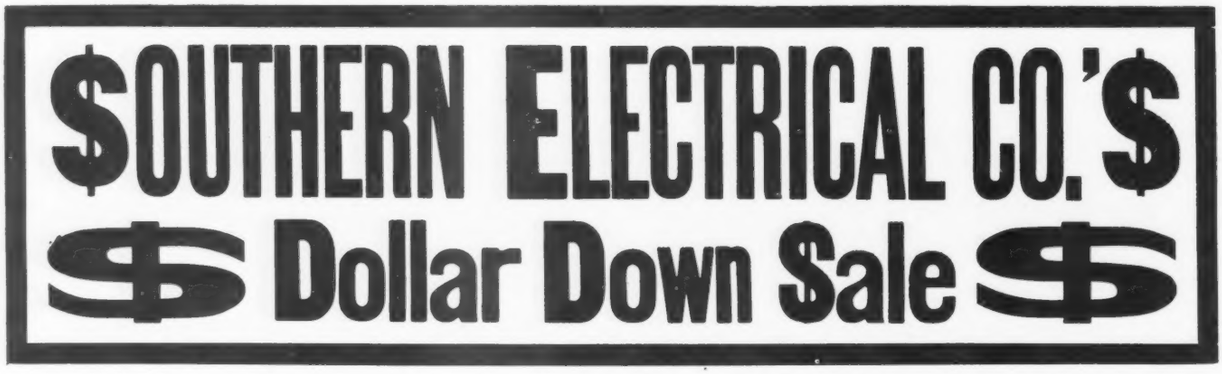
In preparation for the sales drive, large-sized display advertisements were run in the San Diego papers announcing the new payment plan. The features of the "Dollar Down $ale," as it was called, were explained to the public and full details as to how purchases could be made with only one dollar. The advertisements also contained illustrations of the devices that the company handled.

Posters in two colors were also distributed around the city. These were in various sizes. Some were located on billboards, smaller ones being used as windshield stickers. The billboards used were situated at strategic positions around San Diego within a radius of ten miles.

The special sale campaign is not new to the Southern Electrical Company, for it is the policy of the management to conduct sales based upon new ideas several times throughout the year. The poster idea has been found to be very effective and every campaign is heralded by some form of poster. To make the needed variety in these posters the company selects different color schemes for each set of posters. In the "Dollar Down $ale" the posters appeared in blue and red on a white background. By the use of several colors in its posters the company is able to secure variety of treatment and also to attract more attention to the posters than it could, if it used only one color of ink.

Experience has shown that to make any sales campaign of real value to the firm, adequate advertising must precede the dates of the sale by several days. By advertising, the electrical merchant secures the interest in his products that is necessary before the desire for ownership can be created in the minds of his prospects. When desire of ownership has been aroused before the opening of the sale, so that the prospect will come to the dealer's store for a demonstration, only the sale-closing arguments are left to make the prospect a customer. Here the dealer who has provided the small-initial-payment-plan of selling his stock, presents the coupon with the dotted line that the mail order house presents to readers of its advertisements. The electrical dealer has the advantage over the mail order house for the salesman can add the weight of his personality in making the sale.

The low initial payment is the largest inducement to the buyer, because in the "Pay-as-you-use-plan" the customer is permitted to have the equipment installed in her home while a large part of the purchase price remains unpaid. The small extra charge for this method of paying for the equipment will not



The automobile windshield sticker, reproduced above, was printed in blue and red, thus carrying out the color scheme used in the campaign.

"Where Better Electrical Appliances Are Sold"
Dollar Down $ale
The Eden
America's foremost cylinder-type Electric Clothes Washer.
Terms to Suit
The HOOVER
Over a Million Satisfied Users.
SIMPLEX IRONER
"THE BEST IRONER"
Recommended by Every User.
The Three-Westinghouse
ELECTRIC SEWING MACHINE
The Outstanding Electric Sewing Machine on the market today.
Maytag
Gyrafoam
Washer
Cleans by Gyrating Currents and Soapy Suds.
EUREKA
Six Times the Grand Prize Winner.
UTENCO IRONER
The new smaller ironer that can be put in a closet.
Gainaday
OSCILLATOR
For a Limited Time Only
One $ollar Down Places
Any Household Electrical Appliance in Our Stock
In Your Own Home
The Balance in Easy
Weekly Payments
AGAIN we are giving you the opportunity to enjoy the help of modern electrical household appliances by paying only $1.00 at the time of purchase. Arrange the balance in convenient weekly payments. At the Southern Electrical Co. stores you can
Choose from the Best Lines of Household Labor Savers Manufactured
Besides, you have the advantage of a never ceasing service rendered by a concern of known reliability. Don't delay—Pay $1.00 tomorrow!
Southern Electrical Co
Main 4730

Newspaper advertisements similar to this were placed in the San Diego papers prior to the day of the "Dollar Down $ale." The company figured that every reader was a prospective customer.

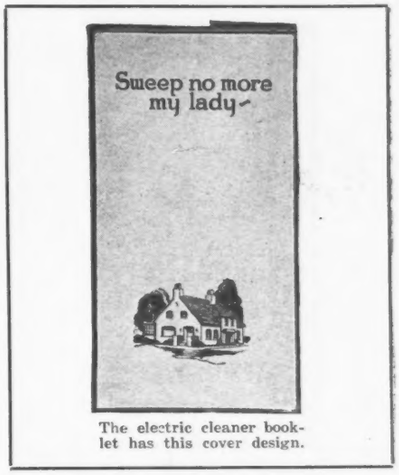
prove to be a stumbling-block to the prospect who has the desire for ownership, in fact, the use of the purchase before it is fully paid for, will more than make up for this extra charge which must be made for buying the merchandise on the installment plan.

The installment plan has been found to be one which is a large sale-producer and one which is highly remunerative to the dealer. In the majority of cases it has been found that purchasers are prompt and honest in their payments. The sale of goods must, of course, be backed by a contract and promissory note to protect both parties. Conditions under which the firm is operating, as has been mentioned, will determine whether the dealer should hold this paper or discount it with a concern operating for that purpose.

Development Society Publishes Illustrated Monographs

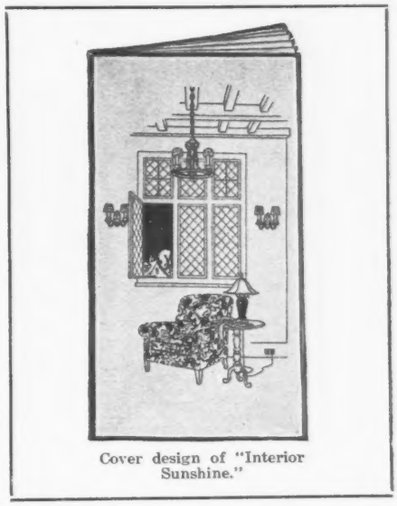
Because the electric cleaner is selling at the rate of hundreds of thousands a year and because the spring cleaning time is the best time to start an intensive cleaner campaign, The Society for Electrical Development in conjunction with the Joint Committee for Business Development, has recently produced an 8-page illustrated booklet on cleaning electrically. The new booklet is entitled "Sweep No More My Lady." It tells the story of electric cleaning in an entertaining style and will make a suitable mailing piece for use by manufacturers, jobbers, dealers and central stations having retail departments.

The Society for Electrical Development has also recently published a consumer booklet that can be used by contractors who desire to mail booklets to home lighting prospects. The title of the new monograph, which is a companion piece to "Building Residence



The electric cleaner booklet has this cover design.

Lighting Business," is "Interior Sunshine." The new booklet consists of twelve pages, eight of which are devoted to the story of a well lighted



Cover design of "Interior Sunshine."

home and the other four giving concrete suggestions for the correct lighting of various rooms.

Descriptive booklets containing illustrations have been found to be material aids to the electrical merchant when putting on either intensive campaigns to move his stock or when he desires to keep up a steady flow of literature to his mailing list. The cost of these booklets has often precluded their use by the electrical dealer, who considers that the expense of making up a booklet of his own will not be justified. When a large number of these pieces of literature are prepared the cost per unit is materially reduced. It is for this reason that national associations of the electrical industry have gone into the field of developing them. In these booklets the publishers make an effort to have the editorial matter of use in any part of the country and have greatly aided the industry.

On the closing day more than 2,000 visitors were turned away from the "Dream Bungalow" which was displayed in Pueblo during March.

6,000 People Visit "Dream Bungalow" in Pueblo

Success of Five Day Exhibit Induces Electrical Interests to Plan Electrical Home Display for Early Summer

Six thousand visitors were given a glimpse of what electricity will do to modernize the home when a "Dream Bungalow" was recently displayed at Pueblo, Colo. The home was open from March 14 to 18 and on the last day 2,000 people were turned away.

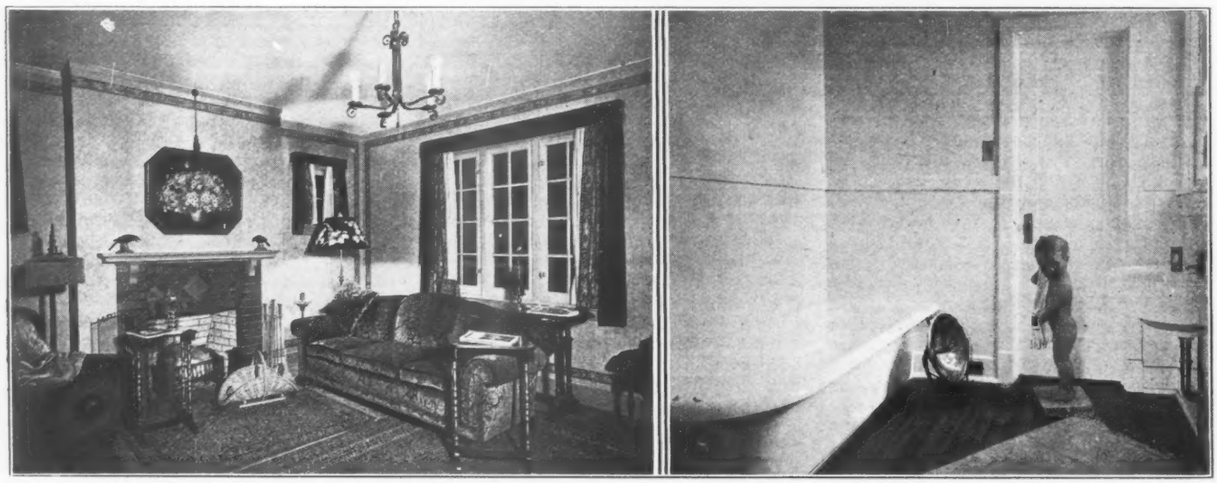
According to E. F. Stone, superintendent of the Colorado Power Company, the "Dream Bungalow" was not primarily intended for an electrical home, but when the opportunity presented itself for the development of electrical features, his company got behind the movement in cooperation with the Kyle Electric Company, which installed the fixtures.

Attention of the public was directed to the importance of proper illumination in the home by means of the attractive lighting fixtures which were installed. Convenience outlets were emphasized. In every case proper appliances were connected to the convenience outlets. The house, a five-room bungalow, was also wired for an electric range.

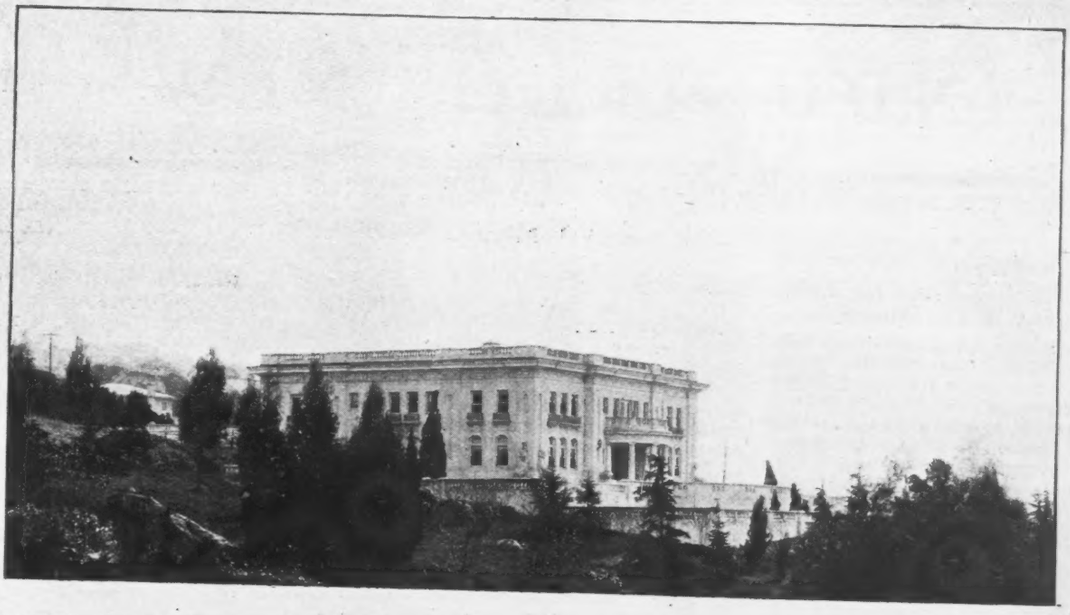
Cooperative advertising in the daily newspapers was the only form of publicity used to direct public attention to the home. All advertising was financed by Harry O. Schmidt, the builder, Calkins-White Bros. Furniture Company, who furnished the home, Robert Innes, a decorator, and the electrical interests. It was largely through word of mouth that visitors were attracted to the display. It is estimated that thousands of additional visitors could have been shown through the home had the showing lasted longer and had more advertising been done.

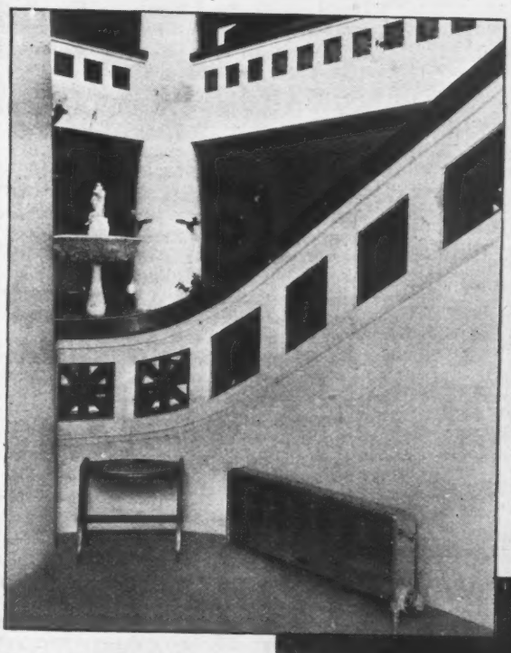
Because of the success of the home in spite of the short duration of the display, plans are now being made to feature an ideal electrical home during the summer months with the aid of the Denver Electrical Cooperative League.

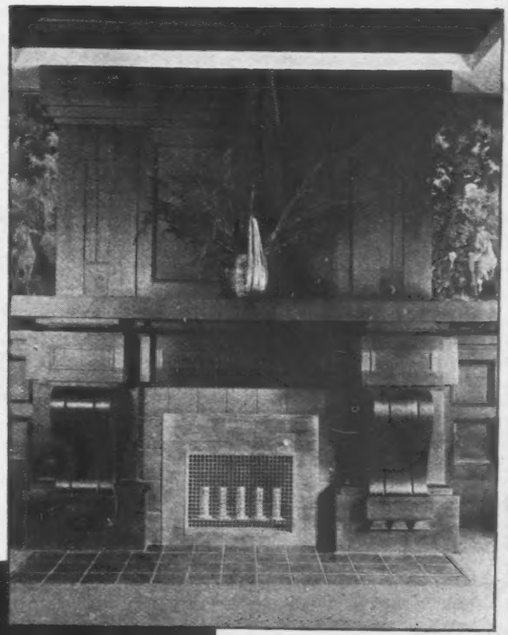
From present indications, electrical home activities in the West during 1923 will include many localities where homes have not been shown in the past. Homes displayed by the electrical interests have met with such a marked degree of success that contractors, subdividers and real estate firms have adopted the idea as a means of bringing to the attention of the public the desirability of owning a home in the particular tract which they are developing.



The home was completely wired, with plenty of convenience outlets and adequate facilities for an electric range. The importance of proper illumination was particularly emphasized.







WHILE electric heat has been applied to apartment houses and homes in various sections of the West with marked success, few tests as to its practicability for schools and offices have been made. A 57.2-kw. installation at the Williams Institute, a high class private school in Berkeley, Calif., after four months of operation, has proved that electric heat is both efficient and economical for heating a structure of this type.

THE electric heaters displaced steam equipment and were not installed until a careful study had been made of all available classes of heating. The consumption of electricity during January and February, 1923, the two most severe months of the year, was 4,900 kw-hr. and 5,400 kw-hr. respectively. The installation includes two 6,000-watt heaters, one 5,000-watt, six 4,200-watt, three 3,300-watt and two 2,500-watt units.

INDUSTRIAL NEWS

Pacific Electric Plans to Build Subway in Los Angeles

Construction work on a subway tunnel that will run from the Hill Street station of the Pacific Electric Railway in Los Angeles, Calif., to carry electric cars under the congested section of the city, will start in sixty days, according to D. W. Pontius, vice-president and general manager of the company. Mr. Pontius stated that the tunnel should be in operation within fifteen months after the bore is started.

It is the intention of the railway company to route most of the Hollywood, Glendale, and San Fernando cars through the tube when it is completed. If this is done it will relieve congestion on Hill Street and Sixth Street materially as these cars are all routed on these streets at present.

The tunnel will cost in the neighborhood of $3,000,000, according to figures given out by the general manager of the railway.

The Pacific Electric Railway and the Los Angeles Railway Company have agreed to install cross-town bus service lines, which would take transfers from either line, if they are given a permit to operate these bus lines. Transfers between the lines themselves, to permit persons living on the lines of the one to transfer to cars of the other company will not be issued at the present time. The city has asked this, but the companies have requested that the universal transfer system be withheld for the present.

The Pacific Electric has notified the city of its willingness to extend its Bunker Hill subway to Pershing Square if the city council will grant it permission to construct a station under Pershing Square that passengers may alight there after arriving in the city through the tunnel. To grant the company this right, the city council will have to order an election to change the city charter which does not provide for the granting of the permission requested. The charter now only gives the council the right to grant right-of-way under parks. The charter amendment may be placed before the voters at the May 1 primaries or at the city election on June 5.

Final Idaho Power Rate Hearing to Be Opened April 30

The hearing for the purpose of fixing the rates to be charged by the Idaho Power Company will be held in Boise, Idaho, on April 30. The fixing of the valuation upon which the company should receive a fair rate of return has been before the Idaho Public Utilities Commission since April, 1920.

The valuation of the company's property used and usable in the public service as of Dec. 31, 1919, was decided upon and now the hearing is to bring this figure up to date. The Southern Idaho Electric Light & Power Users' Association, an organization of towns and cities of southern Idaho, has been opposing the company's claim for valuation.

At the close of the hearing that is to open April 30, the commission will issue an order fixing the rates for all classes of service. It will probably take two or three months before this order is prepared.

Bids for Modesto Distribution to Be Opened May 2

Sealed proposals for the construction of approximately 40 miles of 11-kv. distribution line will be opened by the Modesto Irrigation District at Modesto, Calif., on May 2, 1923. The line will be used for the distribution of the power from Don Pedro Dam on the Tuolumne River. Specifications for the following eight schedules of materials will be furnished upon application accompanied by a check for $5. The schedules follow:

Schedule 1. 900 butt-treated poles.
Schedule 2. 2,150 crossarms.
Schedule 3. Hardware for approximately 40 miles of line.
Schedule 4. Metal and wood pins, 2,300 and 2,500 respectively.
Schedule 5. 4,250 insulators.
Schedule 6. Copper wire, 139,500 lb.
Schedule 7. Nine 11-kv., three-pole switches.
Schedule 8. Four 1,000-kva. and six 150-kva. transformers.

Bidders may submit bids upon either or all of the schedules, but no proposal will be considered for a part of any proposal.

Railroad Seeks Permit to Build Cutoff 118 Miles Long

Formal application has been made to the Interstate Commerce Commission in Washington, D. C., by the Central Pacific Railroad, to construct 118 miles of railroad between Oak Ridge and Kirk, both in Oregon, the first being in Lane County. The new line, designated as the Natron cutoff, is expected to cost approximately $10,000,000.

Construction will enable the Central Pacific and the Southern Pacific systems to gain direct access to the Willamette Valley and to Portland and will provide an alternative route for interstate traffic between Springfield and Junction, and Weed, northern California. The territory to be tapped by the road has extensive timber resources and much agricultural land.

Six Applicants Request Water for Power Development

The Department of Public Works of the State of California received six applications for permits to appropriate water for power purposes during the month of March. The largest project is that of Ray L. Allin, Sacramento, whose petition asks for a permit to appropriate 1,625 sec.-ft. and 1,365,000 acre-feet per annum from Clear Lake and the North Fork of Cache Creek, the water to be taken in Lake County. Mr. Allin proposes to develop 228,000 hp. and will construct 21 miles of conduit and 16 miles of pipe line.

The Modesto Irrigation District has applied for a permit to appropriate 1,500 sec.-ft. and 150,000 acre-feet per annum from the Tuolumne River in Stanislaus County. The district proposes to develop 17,000 hp. at an estimated cost of $360,000. The other applications are for small projects affecting only local areas.

During March the Division of Water Rights issued three permits for the appropriation of water for power purposes. Roy H. Elliott, Hobart Building, San Francisco, has been given permit to appropriate 10,000 acre-feet per year from the North Yuba River in Yuba County. Mr. Elliott proposes to develop 20,682 hp. at an estimated cost of $1,500,000.

Power Possibilities of Marion Lake Told Salem Men

The power possibilities of Marion Lake, a body of water located in the eastern part of Marion County, Oregon, were told recently at a meeting of Salem, Ore., business men by J. G. Kelly, an engineer of Portland. From Mr. Kelly's figures it appears that 18,000 hp. can be delivered in Salem at a total cost of $90 per hp. of capacity.

The plan proposes a low dam, forming a reservoir containing 10,000 acre-feet, conducting 160 sec.-ft. of water through a 66-in. wood-stave pipe, 4 miles in length, and obtaining a total head of 1,455 ft. at the power house. A 66-mile transmission line would be needed to reach Salem.

The Pelton Water Wheel Company of San Francisco has shipped a 57-in. needle valve to operate under a head of 680 ft. at the San Francisquito No. 1 plant of the City of Los Angeles, on the aqueduct near Saugus, Calif. This is part of the equipment required in connection with an 18,000-hp. double overhung impulse unit now nearly completed at the Pelton shops, and which will be the fourth Pelton turbine of this size installed at that plant.

Right-of-way of the new Puget Sound to central Washington transmission line, looking down from the summit of the Wenatchee Mountains. The line is being built across two high mountain ranges.

Power Line Is Being Built Over Two Mountain Ranges

The first commercial power line ever built in the Northwest to cross two mountain ranges is under construction by the Puget Sound Power & Light Company. The line will transmit 27,000 hp. from the Puget Sound country into central Washington. The line is 120 miles long, and will represent an expenditure of approximately $1,000,000. Electrical energy will be transmitted at 110,000 volts.

The line starts at the White River plant of the company, uses the Northern Pacific right-of-way from Green River Gorge over the Cascade Mountains, to the mouth of Tenaway, southeast of Cle Elum, crosses the Kittitas Valley to a point due north of Ellensburg, and thence northerly to Wenatchee, crossing the Wenatchee Mountains west of Colockum Pass, at an elevation of 5,800 ft.

The installation is the three-phase type, and in the construction more than 825,000 lb. of copper cable will be used. Crossing the Wenatchee and Cascade mountain ranges, 100 steel towers are to be employed. On other sections of the line two-pole towers, for balance of construction, will be set, using 55-ft. cedar poles, all heavily anchored.

The construction of the line presages a tremendous development in the Wenatchee and adjacent valleys east of the Cascades, which have long been under a handicap through lack of power. The capacity of the line will be considerably greater than present needs require, but future development is expected to catch up with the power offered. Gold mining in the Cascades and Wenatchee Mountains will be greatly facilitated, as will coal mining in these regions.

Single-Phase Transformers for Eagle Rock Completed

Six of the largest single-phase auto transformers ever built have recently been completed for the Southern California Edison Company by the Westinghouse Electric & Manufacturing Company. The transformers are for outdoor service and have been installed at the Eagle Rock substation of the power company.

The transformers will step the 220,000-volt current from the Big Creek transmission lines down to 150,000 volts so that the present equipment in the Eagle Rock substation can handle it without changing the installation.

The transformers are of the water-cooled type and will form a part of the largest 220,000-volt power system in the world. Each unit is rated at 36,700 kva., 50 cycles, giving a bank capacity of over 100,000 kva. A tertiary winding, connected in delta, is supplied for suppressing third harmonics in the voltage wave.

The transformers are of the shell type and are designed to withstand, without injury, mechanical stresses, due to short circuits when unlimited power is supplied at the terminals. The total weight of each transformer is 90 tons.

Preliminary Surveys for Idaho Plant Are Completed

The Grangeville Light & Power Company of Spokane, Wash., has recently completed preliminary surveys for a new power plant on the North Fork of the Clearwater River, near Orofino, Idaho. Two power sites, three-quarters of a mile apart, are being investigated and during the low water season the company plans to use a diamond drill to determine the character of the river bed.

W. C. Sivyer, president of the company, has stated that it is possible to develop 10,000 hp. at the site. The new plant is contemplated to care for an expected growth in demand for power in the district. The company now has a plant on the South Fork of the Clearwater River.

A new 8,500-hp. impulse wheel for the Electro Power House of the Pacific Gas & Electric Company has just been shipped to the plant by the Pelton Water Wheel Company of San Francisco. The wheel will drive No. 6 generator at the Electro plant and will replace an obsolete wheel of the Pelton type that was built in 1904.

Two booklets on patents and trade marks have been prepared, for free distribution to persons interested in these legal questions, by Richards & Geier, patent and trade mark attorneys of New York City. The booklets explain in layman's language the legal aspects of these two types of manufacturer's protection.

New Financing Company Formed to Handle Western Business

After approximately four years of successful operation in the West, the Republic Finance & Investment Company of Indianapolis, has announced its intention of organizing a California corporation for the purpose of handling the business formerly conducted by the western offices of the eastern company. The new concern will be known as the Republic Company and will have its headquarters in San Francisco.

The new company is being organized as a result of the success which the parent organization has met in its operation in the West. Performing, as it does, a valuable service to the electrical industry in acting as bankers and financial consultants to the merchandising branch of the industry, the company has merited the support which it has received. During the past three years the organization has transacted more than $3,000,000 worth of business and the estimated transactions for 1923 are $2,000,000.

Head offices are maintained in San Francisco with a branch office in Los Angeles. The new company will cover the entire West as far east as Denver. Plans are under way for the establishment of offices in the Northwest in the near future.

The present officers of the California organization are Wesley E. Shea, president; C. Wilbur Fritz, vice-president, and Leo M. Rappaport, treasurer. Mr. Shea is president of the Indianapolis company. Mr. Fritz will be in charge of the activities of the western company.

Additional Service to Be Given Workmen at Steel Plant

Addition of new trains that will provide for workmen employed at the Columbia Steel Company's plant at Ironton, Utah, has been made by the Salt Lake & Utah Railroad, an electric interurban operating between Salt Lake City and Payson, Utah. The service will be offered principally between Provo and Ironton and Springville and Ironton.

The road has taken steps to change the name of Crandall, its station between Infirmary and Fishatch to Ironton, the official name given the new industrial town by the Columbia company and Utah County officials.

The Water and Light Department of the City of Casa Grande, Ariz., is installing a 100-hp. Diesel engine to drive a 70-kva. generator. The district has been surveyed for hydroelectric power to be obtained from the Roosevelt Dam and an election on a bond issue will be held in May. If the bonds are voted for at the election, power will be purchased from the Salt River Valley Water Users' Association, which will operate the plant at the dam.

Construction on the 66,000-volt transmission line of the Beaverhead Transmission Company from Sheridan to Dillon, Mont., will be started within the next sixty days. The line will be 30 miles long and will carry power from the Montana Power Company to Dillon where it will be purchased by the Universal Electric Company who will distribute the power in Dillon.

Three Electrically Driven Boats Are Given Trials

First Electric Tanker in World and First Turbo-Electric Ferry Boat Arouse Interest in Pacific Coast Marine Circles

Interest in electric marine propulsion has centered on the Pacific Coast during the past two weeks where three electrically driven vessels were given initial trials. The trio consisted of the "Standard Service," the first electrically propelled tanker in the world, the "Hayward," the first turbo-electric ferry boat in the world, and the "Golden West," a Diesel-electric ferry boat.

The "Standard Service" was built at the Union Plant of the Bethlehem Shipbuilding Corporation for the Standard Oil Company of California. It is a barge tanker of approximately 3,000 gross tons and will be used in Alaskan service. Its equipment includes two 750-hp. Pacific Diesel engines, two General Electric marine-type generators and two G-E marine-type motors connected to the same propeller shaft. Other electrical equipment on the vessel includes Allan-Cunningham electrically operated steering equipment and cargo winches and electrically driven cargo pumps.

The ferry boat "Hayward" was built at San Pedro by the Los Angeles Shipbuilding & Drydock Corporation for the San Francisco-Oakland Terminal Railways for operation on San Francisco Bay. While Diesel electric drive has already been applied to craft of this type, this vessel is the first ferry boat in the world to have turbo-electric equipment. The propelling equipment consists of a Curtis turbo-generator set, rated at 1,100 kw. with direct connected exciter. Each of the two propellers is driven by a 1,200-hp. General Electric marine-type motor.

The propelling equipment is controlled from the engine room and the control is such that when the speed of the driving motor is furnishing all the power through the aft propeller, the speed of the forward motor will be so regulated that it will revolve only fast enough to relieve the drag or resistance of the forward, or idling propeller.

This arrangement for steam ferry boat purposes is a complete departure from that heretofore used. In vessels equipped with reciprocating engines a continuous shaft passes through the entire length of the vessel, with propellers at each end operating at the same speed. The use of two motors on independent shafts means saving in fuel, increased speed, greater maneuvering flexibility, reliability of action and absence of vibrations.

Each boat carries two 35-kw., direct current, turbine-driven generating sets, which supply power for lighting purposes and operating the steering gear, ventilating motors and all other electrically operated machinery, when the main unit is shut down.

The ferry boat "Golden West" is a sister ship to the "Golden Gate" which has been operated on San Francisco Bay by the Golden Gate Ferry Company. Its propulsion equipment consists of two Pacific Diesel engines con-General Electric generators and two marine-type General Electric motors, one for each propeller.

Year Book Issued by Engineering Standards Committee

The 1923 Year Book of the American Engineering Standards Committee, which has just come off the press, shows that great progress has been made during the last year in standardization projects affecting electrical industries. Of the thirty-five standards thus far approved by the American Engineering Standards Committee, the following three are of special interest to the electrical industries: the National Electrical Code, the Electrical Safety Code and the Code for Electricity Meters.

The report shows that at the end of the year a total of 121 industrial standardization projects were definitely under way or had been completed and the standards approved. Of the projects which have reached an official status, fifteen have to do with electrical engineering; twenty-three with mechanical engineering; twenty-one with civil engineering and the building trades; three with automotive subjects; twelve with transport; one with ships and their machinery; fifteen with ferrous metals; four with non-ferrous metals; twelve with chemical subjects; two with textiles; four with mining; and nine projects with topics of a miscellaneous or general character.

Two hundred and seventy-five national bodies—technical, industrial and governmental—are now cooperating in the work of the American Engineering Standards Committee through officially accredited representatives, and more than nine hundred individuals are serving on the sectional committees which carry on the actual standardization work, the committee acting only as an administrative body.

Decision Handed Down in Johnson Valve Patent Suit

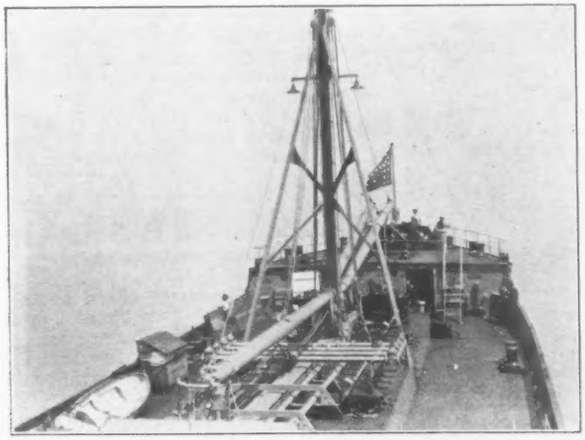
A patent suit relative to the manufacture of Johnson valves by the Wellman-Seaver-Morgan Company has been decided in favor of the William Cramp & Son Ship & Engine Building Company, according to reports which have been received from the East. Johnson valves were originally manufactured by the Wellman-Seaver-Morgan Company under a contract with the inventor.

Following the discontinuance of the contract and at the time the manufacturing rights for Johnson valves were acquired by the Cramp interests, the Wellman-Seaver-Morgan Company entered into the construction of a similar type of valve of its own design. The result was a conflict of patent rights involving the basic design of the Johnson valve, which was made the subject of litigation, terminated as mentioned above.

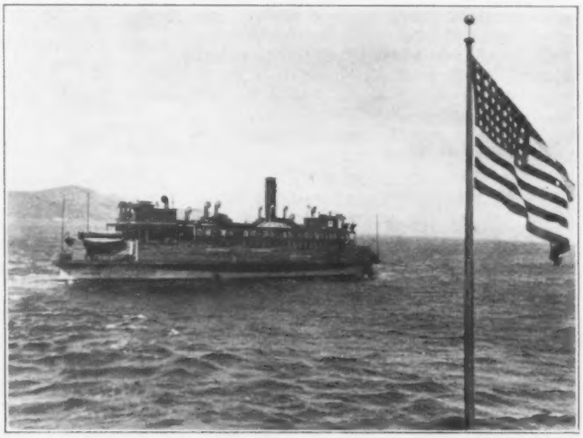
Two Applications Are Filed for Washington Water Rights

The Washington State Hydraulics Division recently received an application from Sterling B. Hill for a permit to divert 1,000 sec.-ft. of water from the South Fork of the Nooksack River. Mr. Hill contemplates the erection of a large hydroelectric power plant and intends to spend in the neighborhood of $2,000,000.

Mr. Hill has also made application for permission to divert 200 sec.-ft. from Whatcom Creek where he plans to erect a $400,000 hydroelectric plant. In addition to this the applicant intends to develop storage amounting to 65,000 acre-feet in Lake Whatcom. This water will also be used for power generating purposes.



Looking forward from the bridge on the "Standard Service," the first electrically driven tanker in the world.



The turbo-electric ferry boat "Hayward" coming into the Golden Gate after a successful trip from San Pedro.

Transmission of Power Started by Turlock District

The first unit of the Don Pedro Power house of the Turlock Irrigation District has been put into service and electricity was transmitted from the power house to the substation, about one-half mile from Turlock, Calif., on April 1. The current that was transmitted was used for drying out transformers in the substation and was not distributed to consumers.

The Delhi section of the Turlock district will be the first to receive power from the new project and engineers on the job report that all three units will be in operation supplying this section before the end of the month. There are now 30 miles of distribution line in the district and more will be added as soon as the work can be completed. The main transmission line is 33 miles long.

The irrigation district has sold electric ranges valued at approximately $20,000 to residents of the section first to receive power from the Don Pedro power house. This section represents only a small part of the Turlock district.

Electrical Spectacle Planned for Denver Exposition

Members of the electrical industry in Denver, Colo., have taken preliminary steps in arranging for a spectacular electrical display at the Pageant of Progress to be held in that city in July. William D'Arcy Ryan, head of the illuminating laboratories of the General Electric Company, arrived in Denver recently to advise the local electrical men concerning the staging of an electrical spectacle at the pageant.

The Denver Electrical Cooperative League will handle the electrical end of the pageant and all of the electrical men in the city will work through the league. The plans at present call for an iridescent color scheme of illumination throughout the exposition grounds. Mr. Ryan has offered his services in aiding the electrical men in illuminating the grounds and the spectacle itself.

Customer Ownership Campaign Is Started by Seattle Company

According to a recent announcement made by A. W. Leonard, president of the Puget Sound Power & Light Company, Seattle, Wash., plans for the marketing of the company's securities have been perfected through the organization of the Puget Sound Power & Light Securities Company. The new company will handle all securities of the parent corporation.

The first offering to the public is a block of preferred cumulative stock yielding approximately 7¼ per cent at the present market price.

"The newly organized securities company now handles and markets all the securities of the parent company," said President Leonard in speaking of the new plan. "Every employee of the power and light company becomes an agent for these securities and every office of the company and its subsidiaries is a place where the public may purchase them.

"We have made this arrangement largely because of the desire of the company, as well as many people in the Pacific Northwest, to have the public in this part of the country share in the earnings of the electrical development of this region.

"In the rapidly developing territory this company serves—including 247 cities, towns and communities from northern Oregon to the Canadian line in western and central Washington—the need is constant for extensions and improvements. In the Pacific Northwest is one-sixth of the hydroelectric power of the United States which we believe should be developed as fast as markets for it are obtained. This development means increased payrolls and the opening of larger and larger areas for agricultural uses, but over-development is economically unsound.

"Construction of new plants and extension of lines all mean the expenditure of new capital. It is estimated that our company will spend more than $4,000,000 on extensions and expansions in the Pacific Northwest this year.

"This constructive use of capital creates securities to meet every requirement of the careful investor. Already upwards of 25,000 persons own securities of this company. But we want more people in the territory we serve to become partners in the company. This we believe to be practical 'public ownership.'"

The Puget Sound Power & Light Securities Company has its headquarters in the Stuart Building, Seattle. The officers are: A. W. Leonard, president; W. H. McGrath, vice-president; Frank Dabney, manager; F. W. Brownell, treasurer; James B. Howe, secretary; Dwight Ware, sales manager; and Roger S. Clapp, assistant treasurer.

Los Angeles Railway Orders Ten Electric Locomotives

To increase its facilities for handling freight, the Pacific Electric Railway of Los Angeles, Calif., has recently placed an order for ten electric freight locomotives. The locomotives are to be of the sixty-ton type and will cost $475,000. Two are to be delivered in the next sixty days.

The Pacific Electric now has forty-three electric locomotives in its freight service and the new locomotives, capable of hauling fifty loaded cars on level track, will greatly speed up the service. The new locomotives were ordered because of the increasing demands made upon the tractive power of the road by the heavy freight coming from Los Angeles harbor.

Transmission Lines Authorized by Modesto Directors

Directors of the Modesto Irrigation District in a meeting held at Modesto, Calif., recently, passed a resolution which is the first step toward permitting the district to erect its own power lines. The resolution permits the construction of lines leading from pumping stations to the nearest power lines of the Pacific Gas & Electric Company. The resolution was passed for the purpose of eliminating long contracts demanded by the power company.

The power company will not furnish transformers and other connections in delivering power to pumping plants unless contracts of long duration are signed. The district is not willing to sign any long-time contracts with the power company.

To Rebuild Transmission Lines in Northern California

Thirty-six miles of transmission line in Siskiyou County, California, will be changed from 34,000-volt capacity to handle 60,000 volts, in the near future, according to reports from The California Oregon Power Company. This company has ordered the materials and in a short time will start the reconstruction of the line.

The portion of the company's line to be changed over to 60,000-volt operation is that between Fall Creek and Yreka. This includes the tap line extending down to Hornbrook. The increasing demands for power in Yreka and at other points along the line have made the change necessary.

The present line, which will be salvaged, was built in 1903. New poles and line equipment will be used and in many places new right-of-way will be used in order to make patrolling of the line easier.

The portion of the line between Yreka and Montague will remain at 34,000 volts. Other transmission line work will include the repairing of the line from Yreka to Indian Creek.

To handle the higher voltage to be used on the Yreka-Fall Creek line, the substations at Fall Creek and Montague will be rearranged to provide for 60,000-volt service. This will not be done until the change in transmission line has been completed.

Lumber Company Places Contract for Large Power House

The contract for the construction of the Long-Bell Lumber Company's power plant at Kelso, Wash., was awarded to the Charles C. Moore Company of San Francisco, Calif. Work will commence at once. A reinforced concrete building is to be erected between the mills.

Two stacks 300 ft. high and 50 ft. in diameter at the base and 21 ft. in diameter at the top are included in the contract. The cost is unofficially estimated at $2,000,000. The plant will supply power to the mills, the city of Longview and logging camps. Ultimate development of 20,000 hp. is expected.

Portland Power Company Reports Show Prosperous Year

Net revenues of the Portland Railway Light & Power Company are increasing in ratio faster than the operating expenses and the operating surplus for February is substantially larger than for the corresponding month a year ago. This situation likewise applies to the 12 months period to the end of February compared with the preceding yearly period.

The company's financial report for February shows operating surplus of $116,451 compared with $65,519 in the same month of last year. Operating surplus for the 12 months, to the end of February amounted to $1,035,586 against $799,186 for the corresponding period to the end of February, 1922.

The Railroad Commission of the State of California recently moved its offices from the Flood Building in San Francisco to the California State Building in the same city. The California State Building is located in the Civic Center.

Utah Builders Exchange Formed to Promote Building

An organization to be known as the Utah Builders' Exchange has been launched at Salt Lake City, for the promotion of the building industry in Utah. The membership of this organization is composed of representatives of the various building industries, such as general contractors, lumber dealers, electrical contractor-dealers, sheet metal contractors, brick manufacturers, etc.

Jasob A. Kahn, president of the Capital Electric Company, of Salt Lake City, has been chosen as president; George Q. Morris of Elias Morris & Sons, vice-president; James S. Taylor of the Morrison-Merrill Lumber Company, secretary; and P. L. Goddard, formerly of the Rocky Mountain Electrical Cooperative League, executive secretary. Ramm Hansen, a prominent Salt Lake City architect, is also a member of the Executive Board, which is composed of Messrs. Kahn, Morris and Taylor in addition to Mr. Hansen.

The objects of the Exchange are:

To bring together into one organization all reputable persons, firms and groups thereof engaged in designing, contracting, manufacturing, merchandising, constructing, or in any way identified with the promotion and protection of the building industry in the state of Utah.

To promote and establish permanently the "American Plan" open shop principle in the building industry in the state of Utah.

To provide ways and means for the promotion and permanent establishment of just, equitable and proper industrial relations between all the different factors in the building industry, most particularly the employer, the employee and the public.

To acquire, possess and distribute to members information of value to them having to do with the particular branch of the building industry in which they are severally engaged.

To establish and conduct apprenticeship schools for the development, education and encouragement of young men who may be induced to enter the building crafts, that the number of skilled proficient workmen may be increased.

To conduct an employment bureau as a medium of contact between employers and workmen in the building crafts.

To effect economies by the standardization of methods, in the interest of the public and its relationship to the building trades, to foster and encourage honest and businesslike procedure and practice on the part of all agencies in the industry.

The administration of the Exchange is vested in the Executive Board, which may consist of five or seven members. The Executive Board is selected from a body known as the Central Council, which is made up of representatives of each of the elements in the building industry. Members of the Central Council are selected by their representative groups. The executive secretary is in general charge of the operation of the Exchange, under the direction of the Executive Board.

Electrical Idea Is Advanced by Denver Radio Matinees

Radio matinees are the newest educational activity of the Electrical Cooperative League in Denver, Colo. Every Thursday at 3 p.m., mountain time, over the Winner Radio Corporation station (KFEL) talks are given by prominent electrical men on subjects related to the application of electricity in the home, inasmuch as the afternoon audiences are known to be largely women and children.

S. W. Bishop, the league manager, gave the introductory talk early in March and is responsible for the arrangement of the program which will include such subjects as the use and servicing of appliances, laundrying by electricity, lighting the home, convenience outlets, etc. Relations with public service companies will also be featured later.

It is planned to occasionally feature a talk at night for the benefit of men who are interested in display lighting or improvements in the electrification of industrial plants. Talks are also being given along the same lines, but in person, to various schools in Denver.

Contract Let for Three Valves for Oak Grove Project

Contracts for three valves for the Oak Grove project of the Portland Railway, Light & Power Company have been awarded to the Pelton Water Wheel Company, of San Francisco. The contracts call for a 72-in. butterfly valve, to be used at the lower end of the penstock, a 72-in. Johnson valve, for the upper end, and a relief valve for the turbine.

The turbine is to be a vertical unit and will develop 35,000 hp., under a head of 850 ft., and will be the highest-head reaction turbine in the world. The turbine is being built in the San Francisco shops of the Pelton Water Wheel Company.

The annual report of the president of the Pacific Gas & Electric Company was broadcasted on April 10, from the Mercantile Trust Company's station at San Francisco. Wigginton E. Creed, president of the power company, delivered the message. It is the first time in the history of the industry on the Pacific Coast that an annual message to stockholders of an electric public public utility has been broadcasted over the radiophone.

The California Oregon Power Company's territory uses more electric power per capita than any other area in the United States and perhaps in the world, according to W. M. Shepard, general agent of the company, who spoke at a meeting of the Copco stockholders recently. The average for the United States is 476 kw-hr. per capita per year, that of the whole state of Oregon 550 and that of the Copco territory 1,330. Mr. Shepard spoke of the present uses of electricity and prophesied an ever-increasing enlargement of uses, especially in the logging industry.

The British Columbia Electric Railway Company has let the contract for the construction of a high-tension transmission line from North Vancouver to Point Atkinson, to H. C. Peterson, of Vancouver. This is the first section of the line to provide power to the Britannia Mining & Smelting Company, at Britannia Beach. Tenders for the second section, from Point Atkinson to Britannia Beach, were opened on April 5. The estimated cost of the whole line, a distance of 30 miles, is $150,000.

The organization of the Moravia Light & Power Company, a non-profit corporation, was recently completed at Sandpoint, Idaho, by the people who expect to secure light and power from this new company.

Investigation of Rapids to Be Celebrated at Banquet

A banquet to celebrate the appropriation of $70,000 for the investigation of the Umatilla Rapids hydroelectric project on the Columbia River will be given April 30 by the Hydroelectric League of Oregon. The association is composed of people of the state interested in the development of hydroelectric power as a basis for future development of the district.

At the dinner N. J. Sinnott, representative in Congress from the Second District; Cyril G. Brownell, representative from Multnomah County; Governor Pierce and Guy W. Phelps, president of the Umatilla Rapids Association, will be among the speakers.

Books and Bulletins

DEPRECIATION OF PUBLIC UTILITY PROPERTIES

By HENRY EARLE RIGGS, A.B., C.E., professor of civil engineering, University of Michigan. 211 pages. 5½ by 8 in. $2. Published by McGraw-Hill Book Company, Inc., New York.

The subject of depreciation is one which has caused much controversy and which, due to the rapid changes in the art of engineering, is still in an unsettled state. Any book which helps to present the true conception of depreciation as applied to valuation and the regulation of public utilities, is to be welcomed. In this book on the depreciation of public utility properties and its relation to fair value and changes in the level of prices, the author has pointed out certain important conclusions with which every one engaged in valuation work should be familiar.

The author attempts to consider the subjects of "fair value" and "depreciation" from an entirely unprejudiced viewpoint and to present his conclusions which have developed as a result of more than twenty years' practice. He states in his preface that this work is a "sincere attempt to find that middle ground of absolute fairness and justice which must be determined before the public utility issue can be considered as reasonably settled."

As a result of the war period price fluctuations, the questions of valuation and depreciation have been greatly complicated and the author warns against the danger of conclusions being reached which may have an effect upon utility properties through the weakening of the stability of valuations already established.

This work should be of value to engineers entering the field of valuation work as it presents considerable information concerning the legal decisions bearing on the relationships between the consumer and the utility giving the service. About one quarter of the book is devoted to legal decisions concerning depreciation.

As a constructive criticism it might be suggested that the use of graphic charts showing price fluctuations and possibly illustrating certain fundamental principles would add appreciably to the usefulness of the book.

E. R. S.

Meetings

Pacific Coast Group Technical Committees Hold Meeting

The final meeting of the sub-committees of the technical section of the Pacific Coast Electrical Association was held at Fresno, Calif., March 20-22. Over sixty out-of-town members of the association were present at the meeting.

During the three-day meeting it was decided that each sub-committee should present two or three short papers on correlated subjects at the Pacific Coast convention, instead of submitting a printed report of the year's activity. These papers will be designed to bring out discussion among the convention delegates.

Technical discussion centered around the subject of three-phase versus single-phase distribution transformers, 4,000-volt distribution and radio communication for central stations. Many of the companies represented favor three-phase distribution transformers and are using them extensively, while others feel that the single-phase type is more flexible under their operating conditions. A large number of the companies are using 4,000-volt distribution systems and others not doing so are changing their systems. Western power companies are rapidly adopting radio communication as a means of maintaining contact with distant power plants. Carrier radio telephone systems are being employed by several companies, while others are using straight radio telephone systems.

The operation of automatic and semi-automatic generating stations was also discussed by the men in attendance at the meeting. The investigation of the apparatus committee states that the economic limit of the automatic generating plant is from 1,500 kw. to 2,000 kw. and capacities below these two.

After the three-day conclave, the men in attendance were the guests of the San Joaquin Light & Power Corporation on several trips of inspection. Included in these trips were the new completely electrified sawmill of the Sugar Pine Lumber Company, the plant of the Sun Maid Raisin Association, outdoor substations and the Kerckhoff plant of the San Joaquin Light & Power Corporation. The Southern California Edison Company later conducted a party of twenty over its Big Creek Development in the high Sierra.

In furtherance of cooperation between the Mountain States Telephone & Telegraph Company and the electrical industry as a whole in Denver, a "telephone party" will be given in that city April 18 under the auspices of the Electrical Cooperative League. A dinner will precede the entertainment, the latter including a demonstration of telephonic interconnection and switchboard operation along with special musical numbers and vaudeville acts provided by Dean D. Clark, commercial manager of the company in Denver, and a member of the league advisory board.

Representative of Underwriters Addresses Oakland Club

Newly elected officers of the Electric Club of Oakland, Calif., presided at their first meeting on April 9. August Lutz, Oakland manager of the Pacific States Electric Company, the incoming president, presided at the meeting.

The speaker of the day was A. R. Small, vice-president of the Underwriters Laboratory. Mr. Small spoke on the work of the Laboratory and made particular reference to the work of the organization on the Pacific Coast.

An evening of unusual interest was provided by two faculty men from the physics department of Reed College, for those attending the March joint meeting of the Portland, Ore., sections of the A.I.E.E. and the N.E.L.A. Professor F. G. Tucker, assisted by Professor A. A. Knowlton, gave an illustrated lecture on "Ultra Violet Light." Ordinarily this might not be considered of sufficient interest to bring before a gathering of engineers, but in the hands of Professor Tucker the attention of the entire audience was held from beginning to end. Professor Tucker also conducted a series of experiments with intense ultra violet rays generated by a special piece of mercury arc apparatus.

A meeting of contractors and supply house representatives of the plumbing and steamfitting business in Denver was held April 3, with a view to forming an organization similar to the Electrical Cooperative League in that city. The success of the Denver organization, especially in its work with architects and builders, is believed responsible for the action. S. W. Bishop, league manager in Denver, was invited to attend and explain the plans, purposes, and accomplishments of such an organization.

COMING EVENTS

American Society of Mechanical Engineers—
Pac. Coast Regional Meeting—Los Angeles, Calif.
Apr. 16-18, 1923

Executive Committee, Pacific Coast Electrical Association—
Los Angeles—April 27, 1923

Southwestern Public Service Association—
Annual Convention—Fort Worth, Tex.
May 15-17, 1923

National Electric Light Association—
Annual Convention—New York, N. Y.
June 4-8, 1923

Pacific Coast Electrical Association—
Annual Convention—San Francisco, Calif.
June 19-22, 1923

Northwest Electric Light and Power Association
Annual Convention—Seattle, Wash.
June 27-30, 1923

American Institute of Electrical Engineers—
Pacific Coast Convention—Del Monte, Calif.
Oct. 2-5, 1923

The Denver Association of Electrical Contractors and Dealers recently decided to offer a prize for the best design of an emblem for the organization. It is desired that the name of the association be worked into the design as far as is possible. The contest is open to all members and will close April 24.

Denver Power Company Men Honor Local Manager

In commemoration of the first anniversary of Clare N. Stannard, as general manager of the Denver Gas & Electric Light Company, 600 men of the Doherty Men's Fraternity in Denver, Colo., assembled at a banquet held there recently. George Williams, general commercial manager of the Doherty properties, was also a guest of honor at the banquet.

Among the speakers of the evening were: D. C. McClure, superintendent of the electric department; R. J. Bardwell, legal counsel of the company; and Mr. Williams. V. L. Board, general superintendent of the company in Denver, acted as toastmaster.

The Electric Club of Los Angeles is about to publish a membership roster of the organization. The roster will be bound in book form and will be distributed to members in good standing. It is the intention of the compilers of the listing to arrange members' names alphabetically as to their own names as well as by firms. The roster will also show the member's name, occupation, telephone and membership number. Only members who are in good standing will be listed in the directory.

The Los Angeles Regional Meeting of the American Society of Mechanical Engineers will open at the Hotel Alexandria in Los Angeles on April 16. The program of the meeting calls for one technical session to be held on the morning of April 16, at which five papers will be presented. Following this session members in attendance will be conducted over points of interest in southern California, including the California Institute of Technology at Pasadena, and the laboratory and shops of the Mount Wilson observatory. Delegates will also visit some of the oil fields in the neighborhood of Los Angeles. Separate entertainment will be provided for visiting ladies. The convention will close April 18.

The date for the Pacific Coast annual convention of the American Institute of Electrical Engineers, has been changed so that the convention delegates will register at Del Monte, Calif., on Oct. 2. The convention will last until Oct. 5. The original date for the meeting was Sept. 25-27, the change being made necessary by a conflict of dates with other conventions scheduled at Del Monte.

K. E. Van Kuran, district manager of the Westinghouse Electric & Manufacturing Company, and **R. E. Fisher,** vice-president of the Pacific Gas & Electric Company of San Francisco, have been appointed a committee of two to arrange for transportation to the annual convention of the National Electric Light Association to be held in New York City. The men will endeavor to secure one special car from San Francisco and Los Angeles to accommodate the electrical men of the two cities who wish to travel to the convention in this way. The convention is to be held June 4-8 and men who wish to make reservations on the special car can do so by addressing either of the members of the committee.

Personals

Ray P. Jackson, for more than twenty years in the service of the Westinghouse Electric & Manufacturing Company, and who at present is manager of the material and process department at East Pittsburgh, has been appointed

RAY P. JACKSON

manager of the new Emeryville, Calif., insulator works of the Westinghouse company. Mr. Jackson will take charge of the factory construction work at Emeryville immediately. He received his electrical education at the University of Michigan, graduating with an engineering degree in 1902. Following this he took the Westinghouse apprentice course. After finishing the course in the shops he advanced steadily from the status of an apprentice to his present position as manager of the material and process department. From 1903 to 1906 he had considerable to do with the development of railway and control apparatus in the shops of the company. The next six years were spent in investigation of lightning arresters, and rectifiers for changing alternating current to direct current without the use of rotary converters. From 1912 to 1917 he specialized on insulators and the following two years were spent in the automotive department. He served as general technical assistant to C. E. Skinner in research work from 1917 to 1920, and was appointed to his present position in 1920. **Marsden H. Hunt,** ceramic engineer, will accompany Mr. Jackson as plant superintendent at the new insulator factory.

F. P. Nightingale, who was formerly connected with the General Electric Company, and who has just returned from a three years' stay in China in the interest of that company, is now connected with the Los Angeles office of the Pacific States Electric Company in the sales department.

L. F. Galbraith, superintendent of the new business department of the East Bay division of the Pacific Gas & Electric Company, has been elected president of the Oakland Ad Club for 1923. Mr. Galbraith acted as treasurer of the club during the past year.

V. L. Board, general superintendent of the Denver Gas & Electric Light Company, was toastmaster at a dinner of the Doherty Men's Fraternity in Denver, Colo., March 29 in honor of George Williams, general commercial manager of Henry L. Doherty & Company.

J. R. Collier, one of the contractor-dealers in Englewood, Colo., a suburb of Denver, has been nominated for alderman at the spring election in that city.

W. S. Eckley of the Pittsfield plant of the General Electric Company, is a recent Pacific Coast visitor.

Z. E. Merrill, formerly superintendent of the Washington Coast Utilities at Wenatchee, Wash., is now assistant general manager of the Mountain States Power Company with headquarters at Albany, Ore. Mr. Merrill's position with the Washington Coast Utilities has been filled by **Frank Walsh,** assistant superintendent of the Puget Sound Power & Light Company at Bellingham, Wash.

W. D'Arcy Ryan, head of the illumination research laboratories of the General Electric Company, recently visited Denver, Colo., to advise with the directors of the Colorado Pageant of Progress as to the scheme of illumination to be employed when that project is staged July 2-15.

E. S. Kassler, president of Nevada-California Electric Corporation with headquarters in Denver, the controlling company for the Southern Sierras Power Company, was one of the speakers at the annual banquet of the Southern Sierras Power Company at Riverside recently.

A. L. Wilson, telephone and telegraph engineer of the California Railroad Commission, has resigned, effective March 31, to engage in general private practice in consulting and engineering work in the telephone field. Mr. Wilson, who graduated from the University of the Pacific at San Jose, was connected with various telephone companies on the Pacific Coast for fifteen years, and entered the service of the commission as assistant rate expert when the late John M. Eshleman was its president. He became head of the division in 1913. Mr. Wilson served as a member of the Joint Committee on Inductive Interference from 1913 to 1917, assisting in drafting General Order No. 52, governing the construction and operation of power and communication lines for the prevention and mitigation of inductive interference.

M. D. Baer, for several years soliciting freight agent for the Bamberger Electric Railway, has been appointed general freight and passenger agent for that company with headquarters in Salt Lake City. Mr. Baer has been with the company in the traffic department since June, 1918.

Fred Brown, manager of the Mountain States Power Company in Eugene, Ore., for the last five years, has resigned and will move to Tacoma on April 15. He has purchased an interest in the Buffelon Lumber Company and will have charge of the auditing and accounting for the firm.

R. P. Sanborn, of the Edison Storage Battery Company of Orange, N. J., is making an extended tour of the Pacific Coast in the interests of the electric trucking industry.

George T. Barker, formerly in charge of lamp sales for the Denver Gas & Electric Light Company, has been appointed merchandise manager of that company and **Jack West,** specialty salesman, has been placed in charge of the sales floor.

Samuel L. Vauclain, president of the Baldwin Locomotive Works, will be the chief speaker at a gathering of engineers at the University of Colorado, May 25, according to a recent announcement of the Colorado Engineering Council.

C. F. Terrell, former superintendent of transportation in Seattle for the Puget Sound Power & Light Company, has been named superintendent of light and power for the company in the Bellingham district, a position recently made vacant by the promotion of R. U. Muffley. Mr. Terrell is succeeded in Seattle by **Joseph Hellenthal.**

John D. Orr, division manager of the Idaho Power Company at Payette, Idaho, and **R. B. King,** superintendent of the company at Boise, recently inspected the properties of the Eastern Oregon Light & Power Company at Baker, Ore. The Idaho Power Company has recently closed a contract for supplying power to the Sun Portland Cement Company whose plant is located near Baker.

L. R. Brown, transformer specialist in the Pittsfield Works of the General Electric Company, is a recent Pacific Coast visitor.

George W. Saathoff, chief engineer of the Cities Service Company, is located at Boulder, Colo., temporarily in developing plans for the new generating plant to be located near that city for the Doherty interests.

E. A. Bradner, newly elected president of the New Mexico Public Utilities Association, has been identified with public service corporations for over thirty years. Starting as an arc light trimmer, he has held all intermediate positions up to that of manager, which office he now occupies with the Las Vegas Light & Power Company and the Las Vegas Transit Company. For a number of years Mr. Bradner was chief engineer and superintendent of the

E. A. BRADNER

Grays Harbor (Wash.) Railway & Light Company and later became manager of the central station at Hobart, Okla., which position he held until 1919 when he was transferred to his present location.

Arthur D. Dana of New York City has resigned from the presidency of the Chicago Fuse Manufacturing Company of Chicago to become chairman of the Board of Directors of the company. **William W. Merrill** has been elected to the presidency.

E. G. Robinson, electrical engineer and president and manager of the Molalla Electric Company of Canby, Ore., and past president of the Northwest Electric Light Association, is a recent San Francisco visitor.

C. M. Mackey of the Mine & Smelter Company, El Paso, Tex., has been spending several weeks in Los Angeles in the interest of his company.

Charles T. Vea, president of the Dover Manufacturing Company, Dover, Ohio, recently spent several weeks in Pacific Coast cities supervising the sales campaigns which his company is inaugurating in this territory.

F. M. Feiker, assistant to the president of the McGraw-Hill Company, Inc., at the request of Secretary Hoover, of the U. S. Department of Commerce, has again been granted leave of absence to undertake the organization and general direction of the world surveys of raw material supplies, rubber, sisal hemp, and nitrates, for which Congress recently made an emergency appropriation of $500,000. Mr. Feiker served as assistant to the Secretary of Commerce during the first year of Mr. Hoover's administration, acting as general assistant in organizing the personnel and industrial trade contact committees in relation to the Bureau of Census, the Bureau of Standards, and the Bureau of Foreign and Domestic Commerce. Out of his nine months' work came the monthly statistical survey of the Bureau of Census, the Division of Simplified Practice of the Bureau of Standards, Commerce Reports in new form, and fifteen so-called commodity divisions of the Bureau of Foreign and Domestic Commerce. Of this latter work the annual report of Dr. Julius Klein, Director of the Bureau of Foreign and Domestic Commerce, said: "The important task of carrying on this liaison work with the industries was under the general supervision of F. M. Feiker, Assistant to the Secretary of Commerce. Mr. Feiker's extensive experience and wide

F. M. FEIKER

contact with industrial organization and individual manufacturers is largely responsible for the striking success which has accompanied this innovation in the organization of a government department."

Chester H. Loveland, a consulting engineer, has announced the organization of the Chester H. Loveland Engineers with offices in the Balboa Building, San Francisco. Associated with Mr. Loveland are **C. I. Rhodes**, former chief engineer of the hydraulic division of the commission, **W. H. Davis**, **J. E. Daugherty**, engineering and cost accountant of the commission, and **Frank A. Daugherty**. Consultation and practice will cover every phase of the financial and physical aspects of development projects.

E. C. Davis, formerly with the merchandising division of the Westinghouse Electric & Manufacturing Company at Pittsburg, is now in the Los Angeles office of that company.

Guy Zinck, formerly with the Westinghouse Electric & Manufacturing Company at East Pittsburgh, Pa., is now in the industrial sales department of the Los Angeles office of that company.

W. D. Crane, who has had considerable experience in merchandising the washing-machine and other electrical household appliances, is now with the Western Electric Company in Los Angeles.

Thomas F. McDonough is now in charge of the Northwest territory of the Benjamin Electric Manufacturing Company. He will have supervision over the states of Montana, Idaho, Washington and Oregon, with headquarters in the L. C. Smith Building, Seattle.

Carl O. Martin, formerly in charge of the Northwest territory of the Benjamin Electric Manufacturing Company, has been transferred to a larger field with headquarters in San Francisco. There he will be assistant to Miles F. Steel, Pacific Coast manager for the company.

G. E. Cullinan, general sales manager of the Western Electric Company of New York, recently visited Los Angeles and other Pacific Coast cities in the interests of his company.

H. B. Vanzwall, manager of the Sunbeam division of the National Lamp Works, Cleveland, was a recent Los Angeles visitor.

Charles A. Hone, formerly with Marshall Wells at Spokane, Wash., is now in the sales department of the Graham-Reynolds Company of Los Angeles.

Frank E. Shepard, president of the Denver Engineering Works; **Thomas B. Stearns**, president of the Stearns-Rogers Manufacturing Company; and **Charles S. Thomas**, prominent Denver, Colo., attorney and former United States senator, were elected directors of the Denver Gas & Electric Light Company at the annual stockholders' meeting of that company in Denver, held March 28.

J. M. Buswell, general inspector of the San Joaquin Light & Power Corporation, Fresno, Calif., will shortly leave for a six weeks' trip to Chicago, New York, Washington and eastern industrial centers.

F. M. Faude, assistant hydraulic engineer of the California State Railroad Commission, has been named chief engineer of the hydraulic division to succeed **C. I. Rhodes**, resigned. Mr. Faude is a graduate of the University of Minnesota and was formerly employed in the United States Reclamation Service.

W. M. Shepard, general agent of The California Oregon Power Company, was made vice-president and general agent of the company at a recent meeting of the board of directors. After graduating from the Alabama Polytechnic Institute in 1904, he spent about a year with the Knoxville and Northern Railroad. In 1905 he took the General Electric Company test course and in 1906 was transferred to the Atlanta office of the company and later to the San Francisco office. While with the General Electric Company in San Fran-

W. M. SHEPARD

cisco he worked successively as supply salesman, apparatus salesman and special agent and was active in applying electricity to gold dredging and other typically western industries. He went with The California Oregon Power Company in 1916 as commercial agent and became general agent in 1918. He has had charge of all commercial activities of this company since his affiliation with it, including negotiations of interconnection agreements with other power companies and in addition has been in charge of valuation work and rate matters of the company.

Walter J. Dodge has been appointed telephone and telegraph engineer of the California Railroad Commission, to take the place of Telephone and Telegraph Engineer A. L. Wilson, who has resigned to take up private practice. Mr. Dodge graduated from Stanford University in the class of 1913 in electrical engineering. After graduation he spent five years with the American Telephone & Telegraph Company in New York City and in California in connection with inductive interference investigation carried on under the auspices of the California Railroad Commission. Since 1918 Mr. Dodge has been employed by the California Railroad Commission, as assistant engineer, in the gas and electrical division, specializing on public utility service and rate matters.

Clare N. Stannard, vice-president and general manager of the Denver Gas & Electric Light Company, has been elected a member of the board of managers of the new million-dollar Presbyterian hospital in Denver, Colo.

C. B. Merrick, who has been with the Valley Electric Supply Company of Fresno, Calif., has rejoined the San Joaquin Light & Power Corporation as assistant to the new business manager.

Manufacturer, Dealer and Jobber Activities

The P. A. Geier Company, of Cleveland, Ohio, has recently prepared a window display for dealers handling the Royal vacuum cleaner. The display is a Dutch scene, with a windmill having metal arms which may be propelled by the blast from a cleaner hose. The whole arrangement demonstrates the power of air and gives the display some moving object to attract attention to it.

Norton & Norton, an electrical establishment in Los Angeles, Calif., recently opened a new store at 1375 North Broadway, by presenting free dancing, music and refreshments for the guests. Prize coupon checks were distributed free to visitors and a drawing was held, the person holding the lucky number receiving a Royal electric cleaner. Other appliances were also given as prizes.

The Hurley Machine Company has recently opened the Thor Electric Shop in Portland, Ore., with H. T. Carstens of Seattle as manager. The store is directly under the home office in Chicago and will be conducted along much the same lines as other Thor stores on the coast. A retail business and a service station will be maintained. A complete line of Hurley goods will be carried at all times and a competent sales force, including demonstrators for window demonstrations, employed. In addition to aiding Thor dealers by means of the new service station, any Thor dealers in the city may make full use of the Thor Electric Shop, sales room and demonstrators.

G. B. M. Medearis has opened a new electrical appliance store to be known as the Ell-Bee Appliance Company at 810 American Ave., Long Beach, Calif. A full and complete line of electrical appliances will be carried. Mr. Medearis was formerly manager of the F. A. Clarge Good Housekeeping Shops. He was, before coming West, sales manager for the Wisconsin-Minnesota Light & Power Company at La Crosse, Wis., and held a similar position with the Iowa Gas & Electric Company at Washington, Iowa.

Frank J. Klimm has opened a new appliance store at 456 Ellis St., San Francisco. George Brouillet has been appointed manager of the new shop.

J. W. Burrchaell, electric fixture manufacturer, will move about May 1, 1923, from 357 Ellis St., San Francisco, to his new location at 434 Larkin St. Increased business and the need for larger quarters are the reasons for the change in location.

Frank J. Mercier and **George A. Stoll** have taken over the electric shop of P. Swartz, 922 Clement St., San Francisco. In the future the store will be known as the Frank J. Mercier Electric Company. Mr. Mercier was formerly connected with the Byington Electric Company and Mr. Stoll with the Walsh Laboratories, both of San Francisco.

The Jeffery-Dewitt Insulator Company, Kenova, W. Va., has recently received large orders for insulators from the Southern Sierras Power Company of Riverside, Calif., and the Washington Water Power Company, Spokane, Wash.

A. Bradshaw, who has been connected with the Steventon Electric Company of San Diego since its organization, has resigned to establish a new jobbing house in that city to be known as the A. B. C. Electric Company. Headquarters for the new company are at 872 Seventh St., San Diego.

The Edison Electric Appliance Company has announced that it is ready to place on the market two new flexible cloth heating pads, 9 x 11 and 12 x 15 in. respectively. The pads are designed to operate from any electric outlet from 95 to 125 volts.

The Westinghouse Electric & Manufacturing Company has placed on the market a new automatic reel-type electric bake oven which provides for uniformity of baking by means of automatic temperature control. Baking has been reduced to a timing operation by means of the new oven, which permits a maximum production.

The Standard Underground Cable Company has moved its general offices and Pittsburgh sales office from the Westinghouse Building to the company's new factory and office building at 100-108 Seventeenth St. The new building is a four-story brick and steel structure occupying an entire block.

The Sprague Electric Works of the General Electric Company announces the consolidation of its district and local offices with the General Electric Company. The manufacture and exploitation of Sprague products will be continued in the name of the General Electric Company in the recently organized merchandising department.

The Winner Radio Corporation of Denver, Colo., has moved its headquarters from 1710 Glenarm St., to 1435 Welton St.

W. H. Harrison, electrical contractor and dealer, has opened a store at 1015 E. Anaheim Blvd., Long Beach, where a complete line of fixtures and appliances are carried.

The Charter Gas Engine Company, Sterling, Ill., has purchased the oil engine business of the August Mietz Corporation of New York City. This consolidation brings together two of the oldest and best known internal combustion engine manufacturers in the world. The equipment of the Mietz company will be moved to the Charter plant at Sterling, which has been doubled in capacity.

The American Insulated Wire & Cable Company, Chicago, has begun the manufacture of magnet wire which will be marketed under the trade name of A-1 Magnet Wire. The line manufactured by the company will include plain enameled, single and double cotton covered, single and double enameled, single and double silk covered and single and double silk enameled.

The General Electric Company has recently published Bulletin No. 41316 which gives a brief treatment of the development of ice-making machines. A share in the increase which has occurred during the past few years is attributable to the slow speed synchronous motor, which is now almost universally used for driving ice-making equipment.

D. B. Brinton has purchased the interest of **George A. Himley** in the Brinton-Himley Electric Company of Murray, Utah. Mr. Brinton plans to increase the stock of the store and its facilities in the near future.

The Pikes Peak Electric Company, 125 North Nevada Ave., Colorado Springs, Colo., has been incorporated by H. F. Pinnock, H. H. Pinnock and R. K. Dougherty.

The United Electric Company, Canton, Ohio, has announced a new model Ohio electric cleaner. Many new features have been incorporated in the new machine including a patented self-starter, which has been made the subject of the company's slogan, "The Cleaner with the Self-Starter."

If you are looking for information about the multiple conveniences of the electric washing machine, vacuum cleaner, dish washer, ironer, sewing machine or range, here is a team that cannot be beaten. Alfred H. Nicoll, the smiling gentleman on the left, is specialty salesman for the Western Electric Company in San Francisco, while his partner, Burton Y. Gibson, can tell you more about the Western Electric Crawford range than any man in the country. Incidentally, if there is ever a meeting of members of the electrical industry in their section of the country, which is not attended by one or both, it is because fire or earthquake has kept them away.

Trade Outlook

San Francisco

Building construction continues apace in San Francisco and the metropolitan area surrounding. Electrical contracting is reported as excellent with all of the local contractors busy. Electrical dealers have reported an improvement of business during the past two weeks period. Radio sales are reported to be about the same as this time a year ago, but that buyers are becoming more discriminating and, as a result of competition, prices are lower. A gradual elimination of dealers who are not good merchandisers is noted.

Prospects are favorable for a large and early fruit crop, and recent rains have improved the general agricultural outlook. This has resulted in an improvement of trade in the rural districts. Mining and oil operations as well as construction work have absorbed available labor supplies, and wages are reported good.

Seattle

Reports from all parts of the Puget Sound country indicate that spring activities in practically all lines are under way, and prospects for a prosperous spring and summer business are encouraging. Public improvements will be heavy, particularly street and highway work, for which satisfactory appropriations were made by the recent Legislature.

Building activities show a heavy increase, this condition existing in all lines of new building. Apartment structures appear to be popular. This is always interesting to electrical men, especially since in Seattle electric ranges are being installed in all of the higher-class apartments. In the furnished buildings, it is customary to provide an electric vacuum cleaner in many of the more expensively equipped structures.

Department stores report a substantial increase in net sales, during March, as compared with the first three months of the year. During February, the increase in net sales as compared with February of 1922 amounted to 20.1 per cent, and March is expected to make an even better showing.

According to figures prepared by the Seattle Port Warden, the first three months of 1923 have maintained the forward movement that made 1922 one of the banner trade years in the history of the city's waterborne commerce. Heavy gains in import movement are noted.

Electrical dealers and contractors are preparing for a very busy spring period,—stocks are in fairly good shape, and if the car shortage is averted, conditions will continue favorable, it is believed.

Portland

Generally speaking, business in this district is in a prosperous condition. This is due in a large part to the healthy condition of the lumber business, where difficulty in keeping ahead of orders is reported. Production is 15 per cent above normal. The demand for all grades of lumber is very active, both from foreign and domestic buyers. Over 15 million feet left Portland by water during March to care for California's building boom, with large shipments to Atlantic and mid-western points. In the foreign trade the Orient is probably the heaviest buyer, with Australia, South America and Europe also taking considerable quantities.

Portland's shipping shows considerable gain over a year ago. During March 125 vessels representing 320,448 tons net register entered Portland harbor as against 99 vessels of 264,306 tons one year ago. This brings the total arrivals for the first quarter of 1923 to 320 vessels of 850,659 tons, as compared with 269 carriers of 727,774 tons one year ago.

Bank clearings for Portland for the first quarter of 1923 were 14 per cent over 1922 and building permits for the same period showed a 23 per cent gain.

Central stations are in the market for a large amount of equipment. Both of the Portland power companies are making large expansions and the loads are growing rapidly.

Jobbers report a slackening of orders for wire, attributed to early buying by contractors for stock, when prices were rising. Collections in the contract dealer class show a slowing up—the average length of time for outstanding accounts in the Northwest for February being 57 days.

Denver

Bank clearings gained $32,061,931.83 during March over the same month last year with a high total of $160,518,985.16 and building permits approximating close to two million dollars equaled the total of the first two months of 1923. This is a basic index of improving business conditions here.

In Pueblo a new record for steel production west of the Mississippi River was established in March with a total of 52,440 tons, a figure far in excess of the March, 1917, record. Coke production increased also.

The agricultural regions, especially where sugar beets are the prevalent crop, are rejoicing over additional payments on the crop of last year due to increasing prices on sugar. Additional payments of over two million dollars have greatly improved financial conditions in those sections.

Building materials are increasing in price almost daily and higher wages went into effect the first of this month, but this does not prove deterring to the general program, judging from the new projects being announced regularly. Industrial plants and central stations all seem to be making improvements and additions.

Although some lines of electrical materials are scarce, there is no marked dearth, thanks to improving transportation conditions reflected by the railroad reports of increased tonnage and car loadings for the past month. Reserve stocks are not being purchased owing to uncertain prices. Wire, conduit, and schedule materials are moving rapidly and appliance sales are picking up.

Salt Lake City

One of the most significant indications of continued and increasing industrial and business activity in this section is a recent statement made by D. C. Jackling, manager of the Utah Copper Company, who pointed out the bright prospects for copper and told of the near approach of the Utah Copper Company to its former production. He stated that he hoped by the end of this year to have the Utah Copper Company yielding and reducing 40,000 tons of ore daily. This means a large amount of money poured into the channels of trade in Utah.

With lead, copper, and other metals, sugar and wool at satisfactory price levels, there is a decidedly optimistic feeling throughout this section.

Several new industries are planning to begin operations in Salt Lake City in the near future, and construction work has started on the plant of the Columbia Steel Corporation near Provo, Utah.

Activity in real estate transfers and building in Salt Lake City indicates a healthy growth and forecasts a year of prosperity. Plans are being drawn or construction work started on many homes and apartments.

Healthy increases are reported in the value of retail sales in general in this territory, as compared with corresponding periods of last year.

New home building is stimulating electrical appliance sales.

The Utah Power & Light Company sold 1,120 washing machines during its March campaign.

Los Angeles

Surpassing any other previous month in the history of the city by more than $8,000,000, building records for March show a total of 5,556 permits, with a valuation of $21,196,087, which were issued in Los Angeles. This is an increase of $14,280,871 over the valuation of building permits issued in March, 1922, and a gain of $9,115,777 over February, 1923. So far this year the valuation of the 14,306 permits granted, totals $44,534,914.

The real feature of the new March building record is not altogether in the fact that the valuation is $21,196,087, but the records also show that permits issued here last month will provide accommodations for 3,507 new families.

The Collector of Internal Revenue for Los Angeles District reports that 225,000 returns of all kinds were filed in this district compared with 185,000 last year, a gain of 40,000. Individual returns to the number of 198,405 were made.

Manufacturers and jobbers report large sales of electrical supplies and appliances, while dealers report the sales as being excellent for this period of the year.

Construction News

Bridges

Ariz., Yuma—W. W. Wilson, superintendent of Tucson division, Southern Pacific Railway, states that work will start on new bridge over Colorado River as soon as engineers have decided that the site tentatively selected is suitable. The bridge will cost several million dollars.

Ore., Salem—The following bridge contracts have been awarded by the state highway commission: Canby-Aurora section of Pacific highway in Clackamas County, bridge No. 584 over Pudding River, near Aurora, to Tobin & Pearce of Portland at $74,750; Hayden Creek-Keno section of the Ashland-Klamath Falls highway in Klamath county, bridge No. 955 over Klamath River near Spencers, to the Union Bridge Company at $41,510, contingent on approval of federal and county governments.

Wash., Vancouver — Clarke County commissioners announce that plans will be drawn immediately for a bridge over Washougal Creek, on the route of the North Bank highway, the estimated cost of the structure to be $25,000. Bridge will be of steel, two spans, one of 140 ft. and the other 70 ft.

Wash., Spokane—C. L. Graves, here, on a bid of $27,275, received the contract for three bridges on the Valley Chapel-Mount Hope road. Bridges will be of concrete.

Wash., Seattle—At the city election of May 8, voters will pass on a bond issue to construct the Montlake-Stadium bridge, across the Lake Washington Canal, direct to the University district. Such a structure is estimated to cost $500,000.

Wash., Everett—Snohomish County has commissioned the Union Bridge Company to prepare plans for erection of three steel spans, two of which will cross the Stillaguamish River at Arlington, and the third will replace the Snoqualmie high bridge, near Monroe. The three bridges will cost $100,000 and will provide spans 20 ft. wide. The two spans, known as the Lincoln and Haller bridges, across the Stilliguamish, will be 210 ft. and 200 ft. respectively; the third will be 220 ft. long.

Dams

Wash., Everett—Contractor T. M. Morgan of Everett has been awarded the contract to construct the new twenty million gallon reservoir on his bid of $150,725.

Highways

Calif., Santa Barbara—County Surveyor Owen H. O'Neill has been instructed to prepare plans and specifications for a permanent road division in the Santa Ynez valley. This is the first step toward the paving of 25 miles of highway in this territory. The petitioners asked for 18-ft. oiled macadam roads. The proposed road will connect with the San Marcos road and run through Solvang, Janin's corner, Ballard, Los Olivos and Zaca station. The project will amount to approximately $1,000,000. The district represented embraces 400,000 acres.

Ore., Salem—The state highway commission has made the following awards of contracts for highway construction: Redmond-Cline Falls section of the Mackenzie highway in Deschutes County, a county and state project, 4.78 miles grading and surfacing to G. K. March, Spokane, at $35,829; Lamprey Creek-Fat Elk Creek section of the Roosevelt Coast highway section in Coos County, 7.75 miles of grading to John Hampshire of Grants Pass, low bidder on concrete pipe at $220,350, contingent on approval of federal and county governments; Eugene-Goshen section of the Pacific highway in Lane county, 4.5 miles of pavement resurfacing and 0.43 miles of new pavement to Force & Currigan of Portland at $100,000—a state project; Otter Rock-Agate Beach section of the Roosevelt Coast highway, 5.5 miles of grading to Hetrick, Kline & Gardner of Portland at $181,080—a state project.

Ore., Salem—Marion County is working on a market road program that was sanctioned by popular vote, authorizing bonds to be issued in the sum of $850,000; 25 to 30 miles of paving is planned for this year and 5 paving plants are to do the work. This is a five-year program, with two more years to run. The original program called for 100 miles of paved market roads and 50 miles of graveled roads connecting with them—joining all the principal towns of Marion County together with highways that can be traveled every day in the year in comfort.

Ore., Oregon City—Contracts for two of the road projects were recently awarded by the Clackamas County Court. The Oswego-Wilsonville road, the Oswego-Athey bridge section, a one-course concrete pavement 9 ft. in width eliminating the crushed rock shoulders, went to C. P. Archer of 1025 Frances Ave., Portland, for $33,615. Project No. 6 on the Oregon-Molalla, a one-course concrete pavement 9 ft. in width, with crushed rock in gravel shoulders, to the Oregon Contract Company, 300 Blake-McFall Building, Portland, at $42,499. There are 5 other projects to be awarded.

Wash., Tacoma—Pierce County commissioners will receive bids until April 25 for paving 2.8 miles of Pioneer Way, P. H. No. 19. Estimated cost of the improvement is not reported.

Wash., Spokane—The Spokane County program calls for 90 miles of macadam and an expenditure of $850,000. County Commissioner D. H. Ham plans to have every mile of the work surveyed so the right-of-way may be cleared up by fall. The program outlined is the biggest mileage program ever planned with bond money and covers the sections of roads voted at the time the bond issue was authorized. There is no concrete or asphalt to lay next year.

Ore., Salem — The state highway engineer, James F. Allen, announces that the state highway program for 1923 will involve an approximate expenditure of $4,465,000 to be used in the construction of primary highways and bridges. The largest job to be undertaken is the paving of 36½ miles of the Pacific highway between Toledo and Kalama which will result in a continuous stretch between Tacoma and Portland. The work will be let in seven contracts involving an estimated total of $1,380,000. Contracts are to be let soon for all work.

Wash., Kelso—The Kelso-Castle Rock road project has been awarded to J. Worter of Tacoma at $171,951; 5.29 miles of the Pacific highway to be graded, drained and paved between Kelso and Stockport. The same bidder was awarded the contract for similar work on 4.62 miles at $148,435, from Stockport to Castle Rock.

Irrigation

Calif., Sacramento—A contract providing for the construction of approximately thirteen miles of levee work in Reclamation District No. 1,660, Sutter County, was awarded to the W. E. Callahan Company of Texas by the state reclamation board at a recent meeting. The cost of the work will approximate $1,000,000.

Mont., Missoula—Plans for the expenditure of $600,000 on Flathead projects by the U. S. Reclamation Service have been made known. For the completion of the concrete arch dam of Hubbart reservoir, for Camas division, $223,000; for enlargement of the Ninepipe reservoir in Mission Valley, $120,000; construction of Taber canal to the north fork of Jocke River, $88,000; enlargement of the table canal, $40,000; construction of laterals of Mission Valley division, $30,000; construction of laterals for Camas division, $10,000; construction of laterals on the Jocke division, $45,000; operation and maintenance, $55,000.

Wash., Kelso—Plans for the Long-Bell Lumber Company for enlargement of Diking District No. 1 have been approved by Cowlitz County commissioners, the plans providing for protection of Longview, West Kelso and the Long-Bell Lumber Company's holdings. The enlarged district will contain 12,000 acres, and improvement will cost $2,250,000.

Wash., Centralia—The excavation of approximately 200,000 cu. yd. of earth is involved in a contract upon which bids will shortly be called by the commissioners of diking and drainage district No. 1 at Centralia. Project provides for draining about 4,000 acres of land near Centralia. Guy Smith is secretary.

Power Plant Equipment

Colo., Denver—Recent improvements announced by the Denver Gas & Electric Light Co. include a new $100,000 gas holder and pump house at 20th and Marion Streets, a new substation at 39th and York Streets, and extensive additions to the Barker substation.

Power Projects

Colo., Denver—A hydroelectric power project in Hinsdale County has been assured by L. F. Hulen and associates of this city, from the Hinsdale Mining & Development Co. and the Golden Fleece Consolidated Mining Co., and plans are being made for the realization of a 6,000-hp. plant to be located near Lake City, Colo., and close to the site of the present Granite Falls plant. They include the construction of a dam with bedrock foundation and spillway at the lower end of Lake San Cristobal, the largest natural body of water in Colorado, so as to raise the level of the lake 60 ft. and to impound 30,000 acre-feet in storage. A 12,000-ft. pipe line will provide a drop at the power house with a static head of 313.7 ft. H. B. Barnes, consulting engineer of this city, is in charge of the project.

Wash., Seattle—Bonds of the Skagit power project, under development by the city of Seattle, in the sum of $2,520,000 have been sold to R. C. Storrie & Co., San Francisco. The sale of these securities will permit the city to complete the first 50,000-hp. Gorge Creek unit of the Skagit project and deliver power in Seattle, according to C. F. Uhden, engineer in charge. The money from the bond issue will finance completion of the power house, complete the Timber Creek dam, build the transmission lines, install the generators and machinery and build the substations. One substation for the Skagit project, north of the city limits, to cost $200,000, is to be built by day labor under the direction of C. F. Uhden, chief engineer.

Wash., Walla Walla—K. C. Harland, here, has obtained power rights on the Walla Walla River, above Milton, Ore., where he plans to develop power to irrigate 10,000 acres of land, and at the same time develop 4,000 hp. A six-mile flume will be built.

Wash., Olympia—Work of constructing a new power line between Olympia and Tenino, connecting the line of the Puget Sound Light & Power Company from Vancouver and through

Centralia, will begin shortly, and be finished within the next three months. The high line which the Olympia Light & Power Company has been using for several years to get its auxiliary service from the White River power station by way of Tacoma will be connected on as part of the new service.

Wash., Colville—Extension of the power line of the Stevens County Power & Light Company from Colville through Echo Valley and Lake City to Marble will supply a large section of farming country with electricity this summer. The Upper Columbia Company of Marble has contracted with the power company for a minimum of 200 hp. on a 10-yr. contract.

Railways

Ore., Portland—The Portland Railway, Light & Power Co. plans the improvement of streets and the replacing of tracks in the coming year, to cost approximately $500,000.

Ore., Marshfield — Officials of the Western White Cedar Company have announced that a standard gage railroad will be constructed on Dement Creek in southern Coos County, to tap a white cedar tract of 60,000,000 feet. The road will be 2½ miles long and will cost the company $40,000. The road will connect with the Southern Pacific and logs can be forwarded to Coos Bay, the company's manufacturing and shipping center.

Wash., Kelso—Twohy Bros., of Portland and Seattle, have been awarded contract for construction of the roadbed for the Longview, Portland & Northern Railway Company's double track road, which extends about 30 miles from Longview to a point near Olequa. The contract price exceeds $1,000,000.

Ariz., Tucson—According to H. B. Titcomb, president of the Southern Pacific Railway of Mexico, grading on the new section of road between Tepic and La Quenmada, will start within two weeks. This portion of the railroad will close the only gap between Tucson and the City of Mexico. This section will be about 100 miles.

Ariz., Tucson—George B. West, one of the men interested, states that a new rail line from Farmington to connect with the Santa Fe Railway at Gallup, N. M., will be constructed by a group of men, including Harry Chandler, E. P. Clark, M. H. Sherman, Los Angeles, and others who are financially interested in the San Juan basin land. Surango, near Farmington, is the center of an oil boom.

Calif., San Bernardino — W. A. Bichnel has the contract to erect the new 10-stall reinforced concrete round house at Yermo for the Union Pacific Railway. Cost, $46,000.

Calif., Los Angeles—Bids for the construction of a brick administration building at the Division One car house of the Los Angeles Railway, Sixth Street and Central Avenue, have been advertised. The building will adjoin the present car house and will have a frontage of 30 ft. on Central Avenue and be 262 ft. long. The west of the building will contain the office of the division superintendent, cash receivers and office clerks who issue transfers and other supplies to the trainmen. The greater part of the space will be devoted to the trainmen's waiting room, which will be equipped as a library, with game tables and steel lockers.

Mont., Miles City—Two sub-contracts for the construction of the proposed north and south line of the Montana Railroad Company for a distance of 100 miles out of Miles City have been awarded. The first 50 miles south of the intersection with the Milwaukee tracks was let to J. E. Hilton, of Sheridan, Wyo.; the second 50 miles will be built by E. J. Prahl of Miles City, Mont.

Street Lighting

Calif., Los Angeles—Osborn Electric Company, Turlock, submitted low bid to board of public works, at $11,234, for installing ornamental lighting system on Pacific Ave. between Oliver St. and Third St., San Pedro.

Calif., Los Angeles—A. C. Rice, 1963 Santee St., submitted low bid to board of public works at $9,600 for installing ornamental lighting system in Sunset Blvd., between Vista St. and Stanley Ave.

Calif., Los Angeles—C. W. Sparks, 433 San Fernando Bldg., submitted low bid to board of public works at $10,587 for installing ornamental lights on 14th St. between 30 ft. west of Beacon St. and Pacific Ave., San Pedro.

Calif., Los Angeles—Estimates of city engineer, W. G. Knox, for lighting Fourth and Fifth Streets are $14,000 for the former and $16,000 for the latter. Thirteen city blocks are contained in each system. There will be eighty metal standards on Fifth Street and seventy on Fourth Street. Plans and specifications for the system are being prepared.

Ore., Roseberg—The light committee of the city council has been given power to proceed at once with the purchase and installation of a complete new street lighting system for the business district. Cluster lights on ornamental posts are to be installed at a cost of approximately $10,000.

Wash., Everett—The installation of a complete new street lighting system for the business section of the city is being considered by the council and the Everett Chamber of Commerce. A proposition submitted by Ne Page, McKenna Company, electrical contractors, quotes a price of $1.25 a front foot to the merchants, eliminating the street lighting system now in use and substituting a new pole, with individual lights on each pole.

Wash., Tacoma — The city council recently authorized the expenditure of $112,000 for the light department, covering a year's supply of electric meters and transformers, and a quantity of cables, gloves and lamp standards for ornamental street installation.

Streets and Sewers

Calif., Mayfield—Sewer and water bonds in the amount of $50,000 carried at an election held March 27.

Calif., Vacaville—A bond issue for $40,000 to cover street improvements within the city limits carried at a recent election. The city trustees have instructed the city engineer to prepare specifications for the first unit, work on which will be started at an early date.

Calif., Stockton—The city trustees have instructed W. D. Harrington, city engineer, to prepare plans and specifications for a sewage disposal plant to be constructed here at a cost of $75,000. The Imhoff system will be used.

Calif., Lodi—Contract to build a sludge sewage disposal plant for this city has been awarded to Davis, Heller & Pearce Co. The plant will cost approximately $83,000.

Wash., Seattle—Contract for grading and concrete walks on 26th N.E., et al., estimated to cost $32,061, has been let to D. H. Traphagen, Walker Building, for $29,527. Contract for grading and concrete walks on West College Street, was let to Odman Construction Company, on a bid of $10,806. Bids recently opened for grading and paving of 9th Avenue South, estimated to cost approximately $550,000, showed that Puget Sound Bridge & Ddedging Company, on a bid of $496,623, was low. Council took the matter under advisement. The work involves the removal of 750,000 cu. yd. of earth, and 23,050 sq. yd. of 8-in. concrete paving and 7,900 ft. of concrete curb. This project is a part of the Beacon Hill regrade project. Bids were also opened for grading the Golf Heights City property, part of the Beacon Hill regrade, on which the Puget Sound Bridge & Dredging Company, at $74,484, was low. This bid was also taken under advisement. The work involves the removal of 646,000 cu. yd. of earth. Contract for grading in Island Drive was let to the Odman Contracting Company, on their bid of $14,208.

Wash., Hoquiam—This city plans the installation of nearly five miles of sewer mains in the Emerson Avenue district, at an estimated cost of $75,000. Bids will be called for shortly.

Wash., Everett—Paving of Pacific Avenue, from Wetmore to Broadway, with 6-in. concrete, 18 ft. wide, is proposed. City engineer is now preparing plans for the work and bids will be called for shortly.

Waterworks

Ariz., Tucson—Improvements costing approximately $700,000 will be made in the city water distributing system, according to recent announcement made by G. H. Atchley, city water engineer.

Utah, Huntsville—Plans have been completed for the installation of a modern water system here, the water to be piped from springs on the south side of the valley, two miles distant from the town proper. The water system will be owned by a corporation which in turn will be owned by the farmers of the community. The cost of the project will be about $35,000.

Wash., Seattle—All bids for the construction of water mains in Leo Street, et al., estimated to cost $131,365, have been rejected, and new bids will be called. Low bid was that of Paduano & Company, at $134,090. The work involves 30,175 ft. of 8-in. cast iron pipe; 5,425 ft. of 12-in., 2,025 ft. of 16-in., and 50 ft. of 20-in. pipe.

Wash., Everett—Contract for the construction of the 20,000,000-gal. water reservoir to be built as part of proposed waterworks improvements, has been let to T. M. Morgan, Everett, on a bid of $150,635, which was $3,000 lower than the next bid. All bids for laying a 28-in. water main north and south through the city were rejected, and new bids will be called. The low bid for this work was that of the Sumner Iron Works, Everett, at $115,000. Cast iron pipe will be laid.

Miscellaneous

B. C., Vancouver—The Dominion Government has issued instructions to the Wallace Drydock Company, of Vancouver, to proceed at once with the construction of a floating drydock on the north shore of Burrard Inlet, Vancouver, at a cost of $2,500,000.

Buildings (Industrial)

Ariz., Douglas—A. G. McGregor, engineer of the Calumet and Arizona Smelter, has received plans for the enlargement of the plant. A crew of 20 men is at work on excavation. The work on the plant, estimated to cost approximately $1,000,000, will employ many skilled mechanics.

Ariz., Mesa—Attaway-Phelps Cotton Co. will expend approximately $50,000 on a cotton seed oil mill. E. G. Attaway, president. The mill will have four presses. Machinery has been ordered.

Calif., San Diego—Preliminary work has been started on the factory to be built by Vitrified Products Co. on a 17-acre site in Old Town. George W. Kummer is general manager and has charge of laying out the plant. A construction engineer of the American Clay Machinery Co. is on the ground.

Calif., Los Angeles—Architect Albert C. Martin, 430 Higgins Bldg., has completed plans for a 4-story class C furniture warehouse to be erected on Santa Fe Ave. near 8th Street for J. M. Overell Co. Brick walls, 80 x 150 ft., composition roofing, metal skylights, pressed brick facing, maple floors, steel sash, elevator, structural steel, sprinkler system, loading platform, fire escapes. Bids will be taken at once.

Calif., Fresno—Plans are being completed by the engineering department of the San Joaquin Light & Power Corp., Fresno, for construction of a transformer warehouse, a salvage warehouse, general store rooms, meter testing and testing transformer department, a pole treating plant, a dipping plant and a crossarm mill, to be constructed on a 63-acre tract at Orange and California Streets, adjoining the Southern Pacific Co. industrial yards. Estimated cost of the above structures, approximately $300,000.

Calif., San Francisco—Plans have been drawn by Edw. T. Flaherty, architect, I. W. Hellman Bldg., Los Angeles, for a seven-story class C storage building to be erected on Geary Street, at Masonic Ave., for the Bekins Fireproof Storage Company. Estimated cost, $350,000.

Calif., San Francisco—Daniel O'Neill is planning the erection of a 2-story machine shop on the north side of Folsom Street, west of Fourth, to cost $20,000.

Calif., Yuba City—Negotiations are now in in progress whereby the Earl Fruit Company will erect a fruit packing shed and cold storage plant at a cost of approximately $200,000.

Calif., San Pedro—Harbor Dept., Los Angeles, will erect a cotton warehouse on the channel at the foot of 22nd St. It will have a capacity of 50,000 bales. Estimated cost $50,000. J. W. Ludlow, harbor engineer, assisted a group of city and warehouse officials to select a site.

Calif., Los Angeles—MacDonald & Kahn, Loewe's State Bldg., have a contract to erect a $100,000, 4-story class A, concrete loft building at northwest corner Santa Monica Blvd. and Lodi Place for the Cinema Properties Co., Adolph Fleishman, president. Site, 135 x 125 ft. Foundation will provide for additional stories.

Calif., San Pedro—Davidson Construction Co., 1445 E. 16th St., has been awarded a contract at about $425,000 for erecting two factory buildings at San Pedro for the Pacific Coast Borax Co. Albert C. Martin, 430 Higgins Building, architect. The contract includes concrete foundations which were figured separately. The main building will be 3-story, 250 x 400 ft., and is designed for 5 stories. It will be class A reinforced concrete foundation. The boiler house and machine shop building will be 1-story and part 2 stories, 60 x 140 ft., steel frame and roof trusses, concrete walls.

Colo., Denver—A completely electrified 150-ton ice plant will be constructed here by the American Refrigerator Transit Co. at a cost of $300,000, to provide service for fruit and vegetable shippers in the mountain region. According to the announcement of H. B. Kooser, president and general manager of the company, similar plants will later be built at Pueblo and Grand Junction, Colo.

Idaho, Montpelier—The Miles Milling & Elevator Company of this city, of which Frank Miles is manager, has completed plans for the erection of a modern milling plant in Montpelier, and work on the structure will begin in a few days. The building will be four stories, 30 x 40 ft., and will be built of reinforced concrete.

Ore., Salem—A cannery is to be built this season, the site for which has been purchased at Salem and the plans have been accepted. $75,000 has been raised to be used for the building and the purchase of the site, which is located just north of and adjoining the railroad and side of Mill Creek in Salem. This is to be known as a five-line cannery and will handle about 250,000 cases of canned products.

Ore., Astoria—Harry A. Flood, vice-president of the Consumer's Central Heating Company of Tacoma, is planning to make surveys preliminary to the building of a plant in Astoria. The cost is estimated at $100,000.

Ore., Salem—Contract has been awarded to Van Patton & Son of Salem for the erection of a 3-story steel frame digester building, to be built at Salem City for the Oregon Pulp & Paper Company. It was planned by Knighton & Howell of Portland and will be 40 x 50 ft. in size, costing $50,000.

Ore., Hillsboro—The Ray-Mailing Cannery is to make some improvements to the plant, costing approximately $50,000. A 2-story addition to the present plant will be built, 80 x 85 ft. The plans were drawn by C. F. Noakes.

Utah, Magna—Construction of flotation units at the Magna mill of the Utah Copper Company will be completed as rapidly as possible, so that the mill can be brought to capacity production this year, according to D. C. Jackling, managing director and vice-president of the company, who was in Salt Lake City on a tour of inspection during the latter part of March.

Utah, Salt Lake City—The N. O. Nelson Manufacturing Company, a plumbing concern of St. Louis, will erect a large warehouse in Salt Lake City, to cost approximately $125,000, according to plans and specifications prepared by Scott & Welch, architects of this city. The building will be 150 ft. long and 55 ft. wide. It will contain five stories, a basement and mezzanine. It is expected to be ready for occupancy by September 1.

Wash., Spokane—Plans for the construction of an oil refinery here, estimated to cost $200,000,, have been announced by J. P. Graves.

Wash., Puyallup—The Pacific Coast Canning Company is planning to spend $50,000 in improvements to its packing plant.

Wash., Wenatchee — A contract has been awarded by E. F. Gadman for the construction of a 1-story and basement modern warehouse on Kittitas Street, to cost $40,000.

Wash., Seattle—The J. W. Kobi Co., shampoo manufacturers, recent purchasers of the entire block fronting on the east side of Rainier Ave. between Weller and Lane Sts., plan to improve the property with the erection of a modern factory costing approximately $50,000.

Wash., Okanogan — The Boston-Okanogan Apple Company is planning improvements to include packing sheds and storage for the current year at an estimated cost of $60,000.

Wash., Seattle—The Western Pipe & Steel Company, whose plant was swept by a $75,000 fire recently, will immediately rebuild, at a cost approximating that sum.

Wash., Washougal—The plant of the Washougal Woolen Mills was partly destroyed by fire recently, with a loss of $125,000. Plant is to be rebuilt at once. One hundred and fifty men are employed.

Wash., Seattle—The Washington Iron Works, now building a $275,000 plant in Seattle, will build an additional machine shop, the structure to be 126 x 572 ft., costing $75,000.

Buildings (Miscellaneous)

Calif., San Francisco — Newspaper Plant—M. H. DeYoung, owner of the San Francisco Chronicle, has announced plans for a new structure to be erected at Mission and Fifth Streets. The building will be three stories, of reinforced concrete construction, each floor to be 265 ft. in length by 160 ft. in breadth, giving each story a total floor area of 42,300 sq. ft. The street floor fronting on Mission Street will be reserved for stores, the remainder of the building to be devoted exclusively to the production of the Chronicle.

Calif., Los Angeles — Stores—Theater—Architect Elmer Grey, 623 Bank of Italy Bldg., associated with Littleton Co. of Pasadena, is preparing working drawings for the store and theater building to be erected at Pasadena, at corner of El Molino Ave. and Colorado Street, for Pasadena Community Theater Association. The Littleton Co. will be the contractors for the erection of the buildings. There will be an auditorium to seat 7,000 people and a patio with shops along two sides. The auditorium will be class A reinforced construction and the shops class C brick construction; plaster exterior, clay tile roofing, etc. The building will be 110 x 195 ft. The cost will be $200,000.

Calif., Los Angeles — Stores—Offices—Barrett & Hilp, San Francisco, were low bidders at about $126,000 on the general contracting for erecting a 2-story brick store and office building at northeast corner 7th and Alvarado Streets, for the Owl Drug Company. Ward & Blohme, San Francisco, architects. Building will be 172 x 71 ft. with a wing 63 x 72 ft., and will contain 15 stores and 34 offices; brick walls, plastered exterior, cast stone trim, plate glass, reinforcing concrete lintels, composition roofing, pine trim, gas heating. The total cost will be about $160,000.

Calif., Torrance—School—Darrell Condley Co., 520 Marsh-Strong Bldg., was low bidder at $152,000 on the general contract for erecting new high school building at Torrance. Farrell & Miller, Western Mutual Life Bldg., architects.

Calif., San Francisco — Offices—The Pacific Telephone & Telegraph Company has purchased the property at Bush and Larkin Streets, where a telephone building will be erected to care for subscribers in that district. The initial building will cost about $300,000; ultimate construction cost is estimated at $1,000,000.

Calif., San Jose—School—Sample & Cody, of San Francisco, have been awarded general contract for the new $205,000 building addition to the San Jose State Teachers' College. The building will be of Spanish architecture, having two wings of two stories each, connected by a corridor.

Calif., Woodland — School—Contract for constructing the Esparto Union High School, for which bonds were recently voted, has been awarded to Goold & Johns, of Stockton, on a bid of $86,387. The building is to be of brick, with 11 class rooms and an auditorium.

Calif., Visalia—Offices—Contract for the erection of the Security Title Insurance and Guarantee Company $60,000 building here has been awarded to Edgar G. Noble.

Calif., Oroville—Lodge—The Oroville Lodge of I.O.O.F. is planning the construction of a 3-story building to cost approximately $250,000. Work will commence within the next few months. Louis Riley is making arrangements for the purchase of a lot at the corner of Bird and Meyers Streets where the new building will be located.

Calif., Los Angeles—School—J. C. Bannister, 903 N. Mariposa Ave., was low bidder at $122,177 on the general contract for erecting a new school building at Glassell Park school site. Edward Cray Taylor, architect, Ellis W. Taylor, engineer.

Calif., Santa Barbara—Institution—Architects Soule, Murphy & Hastings, 1206 State Street, have been instructed to proceed with plans for the new St. Vincent's Orphanage building. It will be 3 stories with two 2-story wings. Estimated cost, between $300,000 and $350,000. In addition to the main building there will be power house, laundry, home for employees and a school building.

Calif., Riverside—City Hall—The election to vote on $100,000 bond issue for new city hall will be held May 4. The building will cost $93,000 and equipment $7,000.

Idaho, Caldwell — New buildings to cost $140,000 are to be constructed for the College of Idaho. The new Science Hall will cost $75,000 and the gymnasium will cost $65,000, this latter to serve as an assembly hall seating 1,500 people, and will house the music department and the central heating plant for all the college buildings.

Ore., Portland—School—The contract for the construction of the new Multnomah School has been awarded to Waale Shattuck Construction Company on their bid of $94,377.